# Oil DA Neg

## Cuba

### Renewables 1NC

#### A. Uniqueness – Multiple issues with offshore drilling rigs of Cuba make it very likely that oil companies will not keep drilling there

Jeff Frank 05/29/13 Jeff Franks is the Reuters Chief Correspondent for Texas, based in Houston and Reporter. “Cuban oil hopes sputter as Russians give up for now on well” http://www.reuters.com/article/2013/05/29/cuba-oil-idUSL2N0EA00W20130529

There is also Cuba's history of failed wells, which makes it hard to compete for the oil industry's interest in a world where there are many other areas with proven oil reserves. "It is very difficult today with other opportunities out there for a major oil company to justify going to Cuba and spending what will certainly be over $100 million in areas where it is yet to be proven they have recoverable reserves," said Jorge Pinon, an expert on Cuban oil at the Center for Energy and Environmental Policy at the University of Texas in Austin. "It is going to be extremely challenging (for Cuba)," he said.

#### And, Renewable Energy is winning the investment race

American Council On Renewable Energy (ACORE), California Clean Energy Fund (CalCEF), and Climate Policy Initiative 6/25 (ACORE, a 501(c)(3) non-profit membership organization, is dedicated to building a secure and prosperous America with clean, renewable energy. ACORE provides a common educational platform for a wide range of interests in the renewable energy community, focusing on technology, finance and policy. We convene thought leadership forums and create energy industry partnerships to communicate the economic, security and environmental benefits of renewable energy. Founded in 2004, the California Clean Energy Fund (CalCEF) is a family of non-profit organizations working together to accelerate the movement of clean energy technologies along the continuum from innovation to infrastructure. Using tools from finance, public policy and technological innovation, CalCEF pursues these goals at the local, state and national levels via three affiliated entities: CalCEF Ventures, an evergreen investment fund; CalCEF Innovations, which leads CalCEF’s analysis and solutions development; and CalCEF Catalyst, an industry acceleration platform. Climate Policy Initiative is an analysis and advisory organization that works to improve the most important energy and land use policies in the world. An independent, not-for-profit organization supported in part by a grant from the Open Society Foundations, CPI has offices and programs in Brazil, China, Europe, India, Indonesia, and the United States. “Strategies to Scale-Up U.S. Renewable Energy Investment” http://www.oregonwave.org/wp-content/uploads/Strategies-to-Scale-Up-US-Renewable-Energy-Investment.pdf)

Private sector investment in the U.S. renewable energy sector has grown significantly in recent years due in large part to manufacturing and technology cost reductions, state market demand policies, and federal tax policies. The combination of these factors has contributed to impressive growth for the renewable energy industry, and this scale in turn has further reduced technology costs. Over the past five years, more than 35% of all new power generation has come from renewable energy resources, including more than 49% of all new power generation in 2012 – surpassing all other energy sources, including natural gas. Since 2004, more than $300 billion has been invested in the U.S. clean energy market (PREF), including $35.6 billion6 in 2012, with a corresponding significant increase in jobs. Renewable energy generation also enhances energy security by harnessing clean domestic resources to produce more of the energy we consume here in the United States.

#### B. Link - Plan causes massive investment in Cuban Oil

Benjamin-Alvadaro 6 (Jonathan, Report for the Cuban Research Institute, Florida International University, PhD, Professor of Political Science at University of Nebraska at Omaha, Director of the Intelligence Community Centers of Academic Excellence Program at UNO, Treasurer of the American Political Science Association, “The Current Status and Future Prospects for Oil Exploration in Cuba: A Special,” http://cri.fiu.edu/research/commissioned-reports/oil-cuba-alvarado.pdf)

Why is it important to clarify the current status of Cuban energy in the face of a continuing opposition by the United States to anything resembling what can be construed as “good news” for the Castro regime? Obviously, because up until this point it hasn’t cost the United States much if anything. The current policy continues to clearly place at the forefront the sanctity and utility of a comprehensive economic and political embargo in the hopes that it helps to foment a change in regime and a peaceful transition to a democratic system of governance and a complimentary market economy. As energy security concerns continue to percolate up to an increasingly important status in the realm of national security objectives we may begin to see the erosion of the hard position against the Cuban regime regardless of its leadership. The overview of the Cuban energy developments clearly and unambiguously reveals that the Castro regime has every intention of continuing to promote, design and implement energy development policies that will benefit Cuba for generations to come. Cuba is sparing no effort by instituting bottom-up and top-down policy initiatives to meet this challenge. It has significantly increased its international cooperation in the energy sector and continues to enhance its efforts to ensure energy security in these most uncertain of times. But it stands to reason that no matter how successful these efforts are, they will come up short. Two factors may alter this present situation. First, Cuba may indeed realize a bonanza from the offshore tracts that will allow it to possibly address its many energy challenges, from increasing oil production and refining capacity, to improving the nation’s energy infrastructure, ensuring a stable energy future. Second, and no less significant, is the possibility of normalization of trade relations with the United States. This is important not only because it will allow direct foreign investment, technology transfer and information sharing between these neighboring states but it possibly enhances the energy security of both states, and hence, the region, realized through a division of labor and dispersion of resources that serve as a hedge against natural disaster and market disruptions. Moreover, all states could derive benefit from the public information campaigns to promote energy efficiency and conservation presently being promoted in Cuba in the face of diminishing energy stocks and uncertain global markets. Ultimately, and only after normalization, the task still falls to the Cuban government, but the cost will necessarily be spread through a number of sources that are predominately American because of strategic interests, proximity and affinity. It suffices to say that the requisite investment and assistance will have a distinct American tinge to it, inasmuch as American corporations, U.S. government agencies, and international financial institutions, of which the U.S. is a major contributor, will play important roles in the funding of the effort to revitalize the Cuban energy sector. Cuban officials are not averse and perhaps would prefer that the U.S. be its major partner in this effort owing to the fact that most if not all of the cutting-edge technology in energy, oil and gas comes from the United States. It is remarkable that the Cuban energy sector is as vibrant as it presently is, absent the type of infrastructural investment that is available to most developing states, in large part because of the American economic embargo. Finally, the cost is significant and it stands to reason that the longer one waits to address the challenge at hand the higher the cost of modernizing the energy sector. For this reason alone, the American role in assisting Cuba in this effort will be significant and every day that the task is put off, it increases the long-term cost of the effort. This should serve as an obvious point of entry into cooperation with the Cuban government and perhaps can serve as a catalyst for promoting confidence, trust and cooperation in this critical issue area across the region.

#### C. Internal Link – Reliance on oil production crushes the transition to renewables

CBO, 2012 (Congressional Budget Office, “Energy Security in the United States”, May, http://www.cbo.gov/sites/default/files/cbofiles/attachments/05-09-EnergySecurity.pdf)

Even if world oil prices declined as a result of increased U.S. production, most households and businesses would not be substantially less vulnerable to future oil disruptions, for two reasons. First, an expectation by consumers of sustained lower prices would provide an incentive for households and businesses to make long-run decisions— that is, decisions that cannot easily be reversed in the near term—that ultimately increased their reliance on oil. For example, a reduction in gasoline prices would decrease the cost of using less-fuel-efficient vehicles or living far from work. Similarly, if industries expected lower oil prices, they would have less incentive to develop alternative fuel supplies (such as natural gas or electricity) for personal or public transportation. As a result, lower prices might induce households and businesses to increase their reliance on oil in the transportation sector and, thus, increase their exposure to disruptions in the supply of oil. Second, even though oil prices might be slightly lower if oil production was increased, a reduction in cost of a few dollars per barrel would be small compared with the price fluctuations that are common to the oil market. Between 2001 and 2011, price changes of $60 to $90 per barrel of oil occurred. Thus, increased domestic production would leave the vulnerability of most consumers to disruptions in oil markets largely unchanged.38

**D. Impact – Renewable Transition is critical to solve global warming**

**Leahy, ’11** (Stephen, Independent environmental journalist for 16 years, “Permafrost Melt Soon Irreversible Without Major Fossil Fuel Cuts”, Feb 21, http://www.countercurrents.org/leahy210911.htm)

UXBRIDGE - Thawing permafrost is threatening to overwhelm attempts to keep the planet from getting **too hot for** human **survival.** Without major reductions in the use of fossil fuels, as much as two-thirds of the world's gigantic storehouse of frozen carbon could be released, a new study reported. That would push global temperatures several degrees higher, making large parts of the planet **uninhabitable**. Once the Arctic gets warm enough, the carbon and methane emissions from thawing permafrost will kick-start a feedback that will **amplify the current warming rate,** says Kevin Schaefer, a scientist at the National Snow and Ice Data Center (NSIDC) in Boulder, Colorado. That will likely be **irreversible**. And **we're less than 20 years from this tipping point**. Schaefer prefers to use the term "starting point" for when the 13 million square kilometres of permafrost in Alaska, Canada, Siberia and parts of Europe becomes a major new source of carbon emissions. "Our model projects a starting point 15 to 20 years from now," Schaefer told IPS. The model used a 'middle of the road' scenario with less fossil fuel use than at present. Even at that rate, it found that between 29 and 60 percent of the world's permafrost will thaw, releasing an extra 190 gigatonnes of carbon by 2200. The study is the first to quantify when and how much carbon will be released and was published this week in the meteorological journal Tellus. "The amount of carbon released is equivalent to half the amount of carbon that has been released into the atmosphere since the dawn of the industrial age," Schaefer said. The additional carbon from permafrost would increase the average temperatures in the Arctic by **eight to 10 degrees C**, the study reported. Not only would this utterly transform the Arctic, it would also increase the planet's average temperature by about three degrees C, agrees Schaefer. And this increase would be on top of the three to six degrees C from continuing to burn fossil fuels over the next 100 years. The Earth's normal average temperature is 14C, so heating up the entire planet another six to nine degrees C would be like increasing our body temperatures from the normal 37C to a deadly fever of 53 to 60 degrees C. As catastrophic as all this is, Schaefer acknowledges his study underestimates what is likely to happen. The model does not measure methane releases, which are 40 times as potent in terms of warming as carbon. Methane could have a big impact on temperatures in the short term, he says. "There would be a lot of methane emissions. We're working on estimating those right now," he said. The model also does not include emissions from the large region of underwater permafrost. IPS previously reported that an estimated eight million tonnes of methane emissions are bubbling to the surface from the shallow East Siberian Arctic shelf every year. If just one percent of the Arctic undersea methane (also called methane hydrates) reaches the atmosphere, it could quadruple the amount of methane currently in the atmosphere, Vladimir Romanovsky of the University of Alaska in Fairbanks previously told IPS. Nor does the model account for a process called thermokarst erosion, acknowledges Schaefer. This is a widely observed process where meltwater erodes the permafrost and exposes it to warmer temperatures and speeding up the thaw. "We can't model that yet but it could contribute to major releases of carbon and methane," he said. None of this has been taken into account by politicians and policy makers looking to cut humanity's carbon emissions with the agreed on target of keeping global temperatures below two degrees C. Nor is there a wide appreciation for the fact there is no 'reverse gear'. Even if all fossil fuel use stopped today, global temperatures would continue to rise and permafrost would thaw for another 20 to 30 years, Schaefer estimates. And once the permafrost carbon is released, "there is no way to put it back into the permafrost". Even if there was a way to lower the Earth's human-induced fever, it would take a century or more for thawed permafrost to reform, he said. Permafrost has been warming and thawing since the 1980s. A 2009 study reported that the southernmost permafrost limit had retreated 130 kilometres over the past 50 years in Quebec's James Bay region. The major loss of sea ice in the Arctic allows the Arctic Ocean to become much warmer, which in turn has increased temperatures of coastal regions an average of three to five degrees C warmer than 30 years ago. More ominously, large parts of the eastern Arctic were 21C higher above normal for a month in the dead of winter this year, as previously reported by IPS. However, while on the edge of a most dangerous precipice, there is a safer path available. A new energy analysis demonstrates that fossil fuel energy could be virtually phased out by 2050 while offering comfortable lifestyles for all. The Energy Report by Ecofys, a leading energy consulting firm in the Netherlands, shows that humanity could meet 95 percent of energy needs with renewables utilising today's technologies. "The Energy Report shows that in four decades we can have a world of vibrant economies and societies powered entirely by clean, cheap and renewable energy and with a vastly improved quality of life," said WWF Director General Jim Leape. WWF worked on the report with Ecofys. "The report is more than a scenario – it's a call for action. We can achieve a cleaner, renewable future, **but we must start now,**" Leape said in a statement.

#### And, Positive feedbacks ensure runaway warming, causes extinction

Speth 2008[James, dean of the Yale School of Forestry and Environmental Studies at Yale University, New Haven, Connecticut. Currently he serves the school as the Carl W. Knobloch, Jr. Dean and Sara Shallenberger Brown Professor in the Practice of Environmental Policy, The Bridge @ the Edge of the World, pg. 26]

The possibility of abrupt climate change is linked to what may be the most problematic possibility of all—"positive" feedback effects where the initial warming has effects that generate more warming. Several of these feedbacks are possible. First, the land's ability to store carbon could weaken. Soils and forests can dry out or burn and release carbon; less plant growth can occur, thus reducing nature's ability to remove carbon from the air. Second, carbon sinks in the oceans could also be reduced due to ocean warming and other factors. Third, the potent greenhouse gas methane could be released from peat bogs, wetlands, and thawing permafrost, and even from the methane hydrates in the oceans, as the planet warms and changes. Finally, the earth's albedo, the reflectivity of the earth's surface, is slated to be reduced as large areas now covered by ice and snow diminish or are covered by meltwater. All these effects would tend to make warming self-reinforcing, possibly leading to a greatly amplified greenhouse effect. The real possibility of these amplifying feedbacks has alarmed some of our top scientists. James Hansen, the courageous NASA climate scientist, is becoming increasingly outspoken as his investigations lead him to more and more disturbing conclusions. He offered the following assessment in 2007: "Our home planet is now dangerously near a 'tipping point.' Human-made greenhouse gases are near a level such that important climate changes may proceed mostly under the climate system's own momentum. Impacts would include extermination of a large fraction of species on the planet, shifting of climatic zones due to an intensified hydrologic cycle with effects on freshwater availability and human health, and repeated worldwide coastal tragedies associated with storms and a continuously rising sea level. .. . "Civilization developed during the Holocene, a period of relatively tranquil climate now almost 12,000 years in duration. The planet has been warm enough to keep ice sheets off North America and Europe, but cool enough for ice sheets on Greenland and Antarctica to be stable. Now, with rapid warming of o.6°C in the past 30 years, global temperature is at its warmest level in the Holocene. "This warming has brought us to the precipice of a great 'tipping point” If we go over the edge, it will be a transition to 'a different planet,' an environment far outside the range that has been experienced by humanity. There will be no return within the lifetime of any generation that can be imagined, and the trip will exterminate a large fraction of species on the planet.

### Drilling 1NC

#### A. Uniqueness – Multiple issues with offshore drilling rigs of Cuba make it very likely that oil companies will not keep drilling there

Jeff Frank 05/29/13 Jeff Franks is the Reuters Chief Correspondent for Texas, based in Houston and Reporter. “Cuban oil hopes sputter as Russians give up for now on well” http://www.reuters.com/article/2013/05/29/cuba-oil-idUSL2N0EA00W20130529

There is also Cuba's history of failed wells, which makes it hard to compete for the oil industry's interest in a world where there are many other areas with proven oil reserves. "It is very difficult today with other opportunities out there for a major oil company to justify going to Cuba and spending what will certainly be over $100 million in areas where it is yet to be proven they have recoverable reserves," said Jorge Pinon, an expert on Cuban oil at the Center for Energy and Environmental Policy at the University of Texas in Austin. "It is going to be extremely challenging (for Cuba)," he said.

#### B. Link - The plan allows for US-Cuban oil cooperation

Benjamin 10 – Jonathan Benjamin-Alvadaro, Report for the Cuban Research Institute, Florida International University, PhD, Professor of Political Science at University of Nebraska at Omaha, Director of the Intelligence Community Centers of Academic Excellence Program at UNO, Treasurer of the American Political Science Association, 2010, Brookings Institution book, “Cuba’s Energy Future: Strategic Approaches to Cooperation”

Conclusion and Recommendations Undoubtedly, after fifty years of enmity, there is a significant lack of trust and confidence between the United States and Cuba. This is plain from the almost quaint maintenance of a sanctions regime that seeks to isolate Cuba economically and politically but hardly reflects the dramatic changes that have occurred on the island since 1991, not to mention since 2008,when Fidel Castro officially stepped aside as Cuba’s president. Now, the opportunity to advance relations in the energy arena appears to be ripe. Since 2004, representatives from American companies, trade organizations, universities, and think tanks have had the opportunity to meet with Cuban energy officials. The scope and objectives of Cuban energy development schemes have been disseminated, dissected, and discussed across a number of settings where the interested parties are now familiar with and well versed in the agendas and opportunities that exist in this arena. In public discussions, Cuban energy authorities have made it clear that their preferred energy development scenario includes working closely with the U.S. oil and gas industry and using state-of-the- art U.S. oil technologies. The **assessment from U.S. energy experts on the technical acumen and capability of Cuban energy officials has been overwhelmingly positive**.9 Should the U.S. government and the Obama administration see fit to shift its policy so as to allow broader participation of American academics and practitioners in the energy field to attend conferences and meet with Cuban energy officials, it may pave the way to **establishing much-needed familiarity and confidence across these communities**. The United States and Cuba will have a unique opportunity to employ a highly educated and competent cadre of Cuban engineers and technicians to work in critical areas of the energy sector. This will deploy an underused segment of the Cuban workforce, and allow U.S. oil, construction, and engineering firms to subcontract work to an emerging class of Cuban firms specializing in these areas. **The Cubans have accumulated experience and training from past energy cooperation projects and exchanges in Cuba, Mexico, Venezuela, and other countries in the region**. Anecdotal evidence suggests that these contacts and exchanges have been wildly successful because of the Cubans’ high level of competence and strong work ethic. The Cubans have gained invaluable knowledge and experience through the operation and construction of energy facilities in collaboration with their joint-venture partners on the island. The United States possesses few options when it comes to balancing the various risks to U.S. energy security and satisfying energy demand, because U.S. energy independence is not attainable, the policy tools available to deal with energy supply disruptions are increasingly inadequate, and the United States needs to articulate a new vision of how best to manage international energy interdependence. In particular, even if the United States were to choose to exploit all of its domestic energy resources, it would remain dependent on oil imports to meet its existing and future demand. The critical need to improve the integrity of the U.S. energy supply requires a much broader, more flexible view on the quest for resources—a view that does not shun a source from a potential strategic partner for purely political reasons. U.S. decisionmakers must look dispassionately at potential energy partners in terms of the role they might play in meeting political, economic, and geostrategic objectives of U.S. energy security. The Obama administration has signaled that it wants to reinvigorate inter-American cooperation and integration; a movement toward energy cooperation and development with Cuba is consistent with, and may be central to, that objective. The energy-security environment for the United States is at a critical juncture. The productive capacity of two of the United States’ largest oil suppliers, Mexico and Venezuela, has declined, and the supporting energy infrastructure in both countries is in need of significant revitalization. The vagaries of the politics in the region, the variability of weather patterns, and the overall dismal state of the global economy create a setting of instability and uncertainty that requires close attention to the national security interests of the United States vis-à-vis energy. Cuba’s energy infrastructure, too, is in need of significant repair and modernization (its many energy projects notwithstanding); the price tag is estimated to be in the billions of dollars. Delaying work on many of these projects increases costs, because deterioration of the infrastructure continues and eventually pushes up the cost of renovation and replacement. It also stands to reason that the lion’s share of the financial burden of upgrading Cuba’s energy infrastructure will fall to the United States, directly and indirectly. **Changes in U.S. policy to allow investment and assistance in Cuba’s energy sector are a** precondition for international entities to make significant investments, yet this change implies a large American footprint. Trade and investment in the energy sector in Cuba have been severely constrained by the conditions of the embargo placed on the Cuban regime. These constraints also affect foreign firms seeking to do business in Cuba because of the threat of penalties if any of these firms use technology containing more than 10 percent of proscribed U.S. technologies needed for oil and gas exploration and production. American private investment and U.S. government assistance will constitute a large portion of the needed investment capital to undertake this colossal effort. **The longer that work is delayed, the higher the cost to all the investors, which will then potentially cut into the returns from such undertakings**. U.S. cooperation with Cuba in energy just may create an opportunity for the United States to improve its relations with Venezuela, if it can demonstrate that it can serve as a partner (or at a minimum, a supporter) of the Petrocaribe energy consortium. The United States could provide much-needed additional investment capital in the development of upstream, downstream, and logistical resources in Cuba that simultaneously addresses Petrocaribe objectives, diversifies regional refining capacity, and adds storage and transit capabilities while enhancing regional cooperation and integration modalities. **This does not mean that the United States has to dismantle the nearly fifty-year-old embargo against Cuba, but the United States will have to make special provisions** that create commercial and trade openings for energy development that serve its broad geostrategic and national security goals, as it has in the case of food and medicine sales to Cuba. This discussion is intended to help distill understanding of U.S. strategic energy policy under a set of shifting political and economic environmental conditions in Cuba and its implications for U.S. foreign policy for the near and long term. Because the policies can be considered works-in-progress, an understanding of possible outcomes is **important to those crafting future policy** and making changes in the policymaking milieu.

#### C. Internal Link - U.S companies don’t have adequate drilling safety to drill for Cuban oil

**Steffy 2013**. "Business." Houston Chronicle. N.p., n.d. Web. 03 July 2013. **<http://www.houstonchronicle.com/business/steffy/article/Offshore-safety-still-isn-t-making-the-grade-4446362.php>.** 4/19/13 “Offshore safety still isn't making the grade” Loren Steffy is the business columnist for the Houston Chronicle. His column appears on Wednesdays, Fridays and Sundays, and he writes a daily blog that discusses business topics. He has appeared on CNBC, Fox Business, the BBC and the PBS NewsHour. He is the author of "Drowning in Oil: BP and the Reckless Pursuit of Profit" published by McGraw-Hill in 2010 and "The Man Who Thought Like a Ship," published by Texas A&M University Press in April 2012 Before joining the Houston Chronicle in April 2004, Steffy was Texas bureau chief and a senior writer for Bloomberg News in Dallas for 12 years. He also worked at the Dallas Times Herald, the Dallas Business Journal and the Arlington Daily News.

Offshore drilling safety still isn't making the grade. Saturday marks the third anniversary of the worst offshore oil disaster in U.S. history, and many of the improvements that have been made continue to focus on response to disaster than on prevention. For far too long, offshore safety has been defined by the absence of catastrophe, which as we learned three years ago, is a poor substitute for vigilance and prevention. The presidential commission created to investigate the Deepwater Horizon accident this week issued a report card on the progress that's been made in the three years since the accident. Overall, it's a passing grade, but we're a long way from getting into Harvard. We all - the energy industry, regulators, lawmakers and taxpayers - have an interest in making sure such an accident doesn't happen again. At an energy industry conference in Houston this week, John England, vice chairman of the consulting firm Deloitte and head of its oil and gas practice, cautioned that among the biggest risks the industry faces is another safety or environmental disaster. The regulatory response to a second Macondo-like spill would permanently cripple, if not completely curtail, Gulf of Mexico operations. Despite the stakes, the highest grades the commission gave on its progress report were B's for safety and environmental protection and for spill response and containment. Safety gets a B mostly because of new regulations, such as improved standards for well construction. Spill response gets the same mark because of the government's new requirements that containment systems must be available before a well's drilled. The industry got a B-, but that's better than the C- it got last year. "We can say with confidence that offshore drilling is safer than it was three years ago," Bob Graham, the commission's former co-chairman, said this week. Graham's confidence, though, is largely based on prescriptive changes - new rules, response requirements and company policies. It's hard to tell The question of whether drilling is actually safer is difficult to quantify. As I noted last fall, after an explosion on a platform operated by Houston's Black Elk Energy killed three workers, the dearth of incident data for offshore drilling leaves most operators and regulators in the dark. Without a broad base of incident statistics - how many hydrocarbon releases have there been in the past three years, and how does that compare to the previous three, for example - we can't know if operations truly are safer. Some companies track this data internally, but there's a reluctance to make it public. While the presidential commission praised the Obama administration for overhauling the federal agencies that oversee offshore drilling, it overlooked that fact that those agencies release data in a form that is, at best, as complete as Swiss cheese. The lack of data doesn't just mask company performance, it also shrouds the effectiveness of regulators. We may have tighter regulations, but do we have tighter enforcement? Are regulators issuing more citations? Why or why not? Such questions can't be answered by the scant information regulators currently make public. To turn some of those B's into A's, both the industry and the regulator need to become more transparent, to encourage full reporting of offshore incidents and maintenance issues. Even more disturbing, the commission found that Congress failed to ensure adequate resources needed for further improvement. It gave lawmakers a D for failing to provide enough funding for the Bureau of Safety and Environmental Enforcement, the primary regulator for offshore drilling. While lawmakers set up a framework for funding restoration efforts after a spill, the ongoing budget battles in Washington have stymied efforts to provide more funding for rapid spill response efforts. Slacking off? If Congress continues to stifle the regulators, those B's awarded by the commission in other areas are likely to slide. Already, the commission said it found indications that the rate of improvements in safety and environment protection is slowing. The thirst to cut federal spending can't be quenched at the cost of safety. We have come to expect cheap energy in the U.S., but if we expect that to continue, Congress needs to increase funding for offshore oversight.The Gulf is a crucial energy source for the U.S., helping to fuel a rise in domestic drilling that is changing 40 years of energy practice. The benefits of our newfound abundance, though, ride on the industry's ability to drill safely offshore. Given the stakes, the grades need to improve.

#### D. Impact – Oil spill collapse biodiversity

Dolors Armenteras and C. Max Finlayson 12 (Dolors Associate Professor , Universidad Nacional de Colombia Bogotá, Colombia Research field: Biological Sciences - Forestry Science Landscape Ecology, Conservation Biology, Biodiversity, Fire Ecology; Max internationally renown wetland ecologist with extensive experience in Australia and overseas. He has been a technical advisor to the Ramsar Convention on Wetlands and has written extensively on wetland ecology and management. “Biodiversity” http://www.unep.org/geo/pdfs/geo5/GEO5\_report\_C5.pdf)

Pollutants such as pesticide and fertilizer effluents from agriculture and forestry, industry including mining and oil or gas extraction, sewage plants, run-off from urban and suburban areas, and oil spills, harm biodiversity directly through mortality and reduced reproductive success, and also indirectly through habitat degradation (MA 2005a). Inland wetlands and coastal marine habitats face a major threat from waterborne pollutants (Chapter 6) (Finlayson and D’Cruz 2005). Meanwhile, atmospheric pollution in terrestrial systems, particularly the deposition of eutrophying and acidifying compounds such as nitrogen and sulphur (Chapter 2), is also important. Rates of nitrogen deposition increased sharply after 1940 but have levelled out since 1990, probably owing to an overall decrease in biomass burning, though there is regional variation (Butchart et al. 2010). Nevertheless, nitrogen deposition continues to be a significant threat to biodiversity, especially for species that have adapted to low-nitrogen habitats (Dise et al. 2011).

#### And, Biodiversity collapse causes extinction

CASBRC, 2001(California Academy of Sciences Biodiversity Resource Center, “Threats To Biodiversity”, http://researcharchive.calacademy.org/research/library/biodiv/biodiversity\_defined.html)

Currently, more than 10,000 species become extinct each year and while precise calculation is difficult, it is certain that this rate has increased alarmingly in recent years. The central cause of species extinction is destruction of natural habitats by human beings. Human survival itself may depend upon reversing this accelerating threat to species diversity. Among the millions of undescribed species are important new sources of food, medicine and other products. When a species vanishes, we lose access to the survival strategies encoded in its genes through millions of years of evolution. We lose the opportunity to understand those strategies which may hold absolutely essential options for our own future survival as a species. And we lose not only this unique evolutionary experience, but emotionally, we lose the unique beauty, and the unique spirit, which mankind has associated with that life form. Many indigenous human cultures have also been driven to extinction by the same forces which have destroyed and continue to threaten non-human species. It is estimated that since 1900 more than 90 tribes of aboriginal peoples have gone extinct in the Amazon Basin. Nearly every habitat on earth is at risk: the rainforests and coral reefs of the tropics, the salt marshes and estuaries of our coastal regions, the tundra of the circumpolar north, the deserts of Asia and Australia, the temperate forests of North America and Europe, the savannahs of Africa and South America. Tropical rainforests, for example, are among the most diverse of all terrestrial ecosystems. Covering only 7% of the planet's surface, these forests comprise 50-80% of the world's species. 40 million to 50 million acres of tropical forest vanish each year -- about 1.5 acres per second -- as trees are cut for lumber or land is cleared for agriculture or other development. It is estimated that perhaps a quarter of the Earth's total biological diversity is threatened with extinction within 20 to 30 years. The Academy's Commitment The California Academy of Sciences is a leader among the world's institutions for research in evolutionary biology. Staff researchers study biodiversity worldwide, describing more than 100 new species every year. Current projects include work in La Amistad Biosphere Reserve, Costa Rica; the Impenetrable Forest, Uganda; the coral reefs of New Guinea and Madagascar; the deserts of southwestern Asia; and Socorro Island off the west coast of Mexico. Approximately 1.4 million species of plants and animals have been described by scientists. Conservative estimates suggest that at least 5 million remain to be identified -- the vast majority of them in the tropics. Fewer than 1,500 biologists worldwide are now qualified to identify tropical species. If ever there was an urgent requirement for this expertise, it is now, in this time of rapid environmental erosion.

### Uniqueness – Generic Drilling

#### Cuban oil drilling done for the next 5 years

Cave 12 DAMIEN CAVE and CLIFFORD KRAUSS, Damien Cave is a foreign correspondent for The New York Times, based in Mexico City. and he covers Mexico, Central America and the Caribbean.

http://www.nytimes.com/2012/11/10/world/americas/rigs-departure-to-hamper-cubas-oil-prospects.html?\_r=0

Cuba’s hopes of reviving its economy with an oil boom have produced little more than three dry holes, persuading foreign oil companies to remove the one deepwater rig able to work in Cuban waters so it could be used for more lucrative prospects elsewhere. The rig, which was built in China to get around the United States trade embargo, is expected to depart in the next few weeks. With no other rigs available for deepwater exploration, that means Cuba must now postpone what had become an abiding dream: a windfall that would save Cuba’s economy and lead to a uniquely Cuban utopia where the island’s socialist system was paid for by oil sales to its capitalist neighbors. “The Cuban oil dream is over and done with, at least for the next five years,” said Jorge Piñon, a former BP and Amoco executive who fled Cuba as a child but continues to brief foreign oil companies on Cuban oil prospects. “The companies have better prospects by going to Brazil, Angola and the U.S. Gulf.”

#### The oil drilling platform Cuba can use is leaving Cuba

LaGesse 12 David LaGesse, Reporter at U.S. News & World Report, Reporter at The Dallas Morning News

http://news.nationalgeographic.com/news/energy/2012/11/121119-cuba-oil-quest/

Rigged for the Job There's perhaps no better symbol of the complexity of Cuba's energy chase than the Scarabeo 9, the $750 million rig that spent much of this year plumbing the depths of the Straits of Florida and Gulf of Mexico. It is the only deepwater platform in the world that can drill in Cuban waters without running afoul of U.S. sanctions. It was no easy feat to outfit the rig with fewer than 10 percent U.S. parts, given the dominance of U.S. technology in the ultra-deepwater industry. By some reports, only the Scarabeo 9's blowout preventer was made in the United States. Owned by the Italian firm Saipem, built in China, and outfitted in Singapore, Scarabeo 9 was shipped to Cuba's coast at great cost. "They had to drag a rig from the other side of the world," said Jonathan Benjamin-Alvarado, a University of Nebraska professor and expert on Cuba's oil industry. "It made the wells incredibly expensive to drill." Leasing the semisubmersible platform at an estimated cost of $500,000 a day, three separate companies from three separate nations took their turns at drilling for Cuba. In May, Spanish company Repsol sank a well that turned out to be nonviable. Over the summer, Malaysia's Petronas took its turn, with equally disappointing results. Last up was state-owned Petróleos de Venezuela (PDVSA); on November 2, Granma, the Cuban national Communist Party daily newspaper, reported that effort also was unsuccessful. It's not unusual to hit dry holes in drilling, but the approach in offshore Cuba was shaped by uniquely political circumstances. Benjamin-Alvarado points out that some of the areas drilled did turn up oil. But rather than shift nearby to find productive—if not hugely lucrative—sites, each new company dragged the rig to an entirely different area off Cuba. It's as if the companies were only going for the "big home runs" to justify the cost of drilling, he said. "The embargo had a profound impact on Cuba's efforts to find oil." Given its prospects, it's doubtful that Cuba will give up its hunt for oil. The U.S. Geological Survey estimates that the waters north and west of Cuba contain 4.6 billion barrels of oil. State-owned Cubapetroleo says undiscovered offshore reserves all around the island may be more than 20 billion barrels, which would be double the reserves of Mexico. But last week, Scarabeo 9 headed away from Cuban shores for new deepwater prospects elsewhere. That leaves Cuba without a platform that can drill in the ultradeepwater that is thought to hold the bulk of its stores. "This rig is the only shovel they have to dig for it," said Jorge Piñon, a former president of Amoco Oil Latin America (now part of BP) and an expert on Cuba's energy sector who is now a research fellow at the University of Texas at Austin.

### Uniqueness – Russia Drilling

#### Geological problems with a rig in Cuba has caused drilling to stop

Robin Dupre 13 With more than 10 years of journalism experience, Robin Dupre specializes in the offshore sector of the oil and gas industry. “Songa Mercur to Depart Cuba for Vietnam” http://www.rigzone.com/news/oil\_gas/a/127158/Songa\_Mercur\_to\_Depart\_Cuba\_for\_Vietnam

The drilling rig Songa Mercur (mid-water semisub) is departing Cuba for Vietnam after failing to find oil, AFP reported on Tuesday. Drilling work in Cuba was suspended because of a problem-plagued exploration well, and the start of the hurricane season, reported the state-run Agencia de Informacion National (AIN). Songa Mercur was drilling in shallow waters in the central Cuban province of Ciego de Avila about 370 miles east of Havana. Drilling is expected to recommence on the same spot, Block L, early next year. Russian firm Zarubezhneft, operator of the drilling rig, has been searching for oil off Cuba’s coast but its plans were derailed by "geological problems" as well as problems with its rig, which at one point lost its blowout preventer, AFP reported. "Taking into consideration geological complications, Zarubezhneft and (Cuban state oil company) Cubapetroleo have jointly decided to make changes in the initial drilling program by dividing it into two stages," the Moscow Times reported the company as saying at the end of last month.

#### Malaysia and Russia oil companies no longer drilling in cuba, no commercial oil wells found

Orsi 12 Peter Orsi, an editor on its Latin America regional news desk for The Associated Press

http://www.businessweek.com/ap/2012-08-06/2nd-cuban-offshore-oil-well-also-a-bust

A second deep-water exploratory well in the Gulf of Mexico has proved a bust, Cuba's state oil company announced Monday, dealing another blow to the island's dreams of petroleum riches. The drilling operation carried out by PC Gulf, a subsidiary of Malaysia's Petronas, and Gazpromneft of Russia, concluded July 31 off the western province of Pinar del Rio, Cuban state oil company Cubapetroleo said in a statement. Analysis of the findings revealed an "active petroleum system that could extend to other parts of the four blocs contracted by PC Gulf and Gazpromneft, and even beyond their limits," read the statement, which was published by Communist Party newspaper Granma. "Nevertheless, at that point the rocks are very compact and do not have the capacity to deliver significant quantities of petroleum and gas," it continued, "so it cannot be qualified as a commercial discovery."

### Uniqueness – Spain Drilling

#### Repsol will not continue to drill offshore Cuba

Tamayo 12 Juan O. Tamayo Writer at The Miami Herald and Correspondent at United Press International Mexico/Central America news chief http://www.miamiherald.com/2012/05/30/2823567/repsols-move-raises-questions.html

Spain’s Repsol oil company announced Tuesday it was “almost certain” to withdraw from exploration in Cuba, after spending an estimated $150 million on a dry well and seeing far more profitable prospects in other countries such as Brazil and Angola. The announcement was a blow to Cuba’s hopes to strike it rich quickly, jump-start its stagnant economy and trim its dependence on Venezuelan subsidies, although another foreign company is currently drilling a separate test well and others have options to follow. “We won’t do another well” in Cuba, Repsol Chairman Antonio Brufau said in presenting the company’s 2012-16 business strategy at a news conference in Madrid on Tuesday. “The well we drilled turned out dry and it’s almost certain that we won’t do any more activity there.” Repsol spent about $150 million since 2000 exploring off Cuba’s northern coast near Havana, with one well in 2004 that did not find oil “in commercial quantities” and one this year that was dry, said Jorge Piñón, a longtime Cuba oil analyst with the University of Texas.

### Link – Renewables

#### Engagement causes US companies to Invest in Cuban oil

Nick Miroff 9, Washington Post, 5/16/9, “Cuba's Undersea Oil Could Help Thaw Trade With U.S.,” http://www.washingtonpost.com/wp-dyn/content/article/2009/05/15/AR2009051503416\_pf.html

"Until trade barriers are removed, Chevron is unable to do business in Cuba," said Chevron spokesman Kurt Glaubitz. "Companies like us would have to see a change in U.S. policy before we evaluate whether there's interest." Robert Dodge, a spokesman for the American Petroleum Institute, said his organization is not lobbying for access to Cuba, and Texas congressional representatives with ties to the oil industry said they are focused on opening U.S. territorial waters to drilling. But observers of U.S.-Cuba relations say American companies haven't been sitting on their hands and remain in conversations with Cuban counterparts. At the 2006 Mexico energy conference, U.S. oil companies "all had plans to move forward as soon as the U.S. government gives them the go-ahead," said Benjamin-Alvarado, who attended the conference. If that go-ahead is granted, American companies would be entering a drilling contest crowded with foreign competitors. Several global firms, including Repsol (Spain), Petrobras (Brazil) and StatoilHydro (Norway) are exploring in the Gulf of Mexico through agreements with the Castro government, and state companies from Malaysia, India, Vietnam and Venezuela have also signed deals. Sherritt International, a Canadian company, has had oil derricks pumping heavy crude along Cuba's north coast for more than a decade, extracting about 55,000 barrels a day, mostly for Cuba's domestic energy consumption. But most of Cuba's undiscovered reserves are thought to be in two offshore areas. The oil and gas that make up the USGS estimate lie in an area known as the North Cuba Basin, a short distance off the island's northwest coast. The larger deposit is thought to be in a section of the gulf known as the Eastern Gap, to which Mexico and the United States also have a claim. Cuban officials believe there are 10 billion to 15 billion barrels of crude stored there under more than 5,000 feet of seawater and 20,000 feet of rock-- costly to extract but accessible with existing technology. By comparison, U.S. proven reserves total 21 billion barrels.

**Plan trades off with renewables**

**Altaffer ‘8** (Mary, “Ten Reasons Not to Expand Offshore Drilling”, Sept 15, http://www.americanprogress.org/issues/green/news/2008/09/15/4894/ten-reasons-not-to-expand-offshore-drilling/)

10. Debating offshore drilling in sensitive areas **distracts from real solutions**. Instead of focusing on offshore drilling in sensitive areas, we should be thinking about both short- and long-term solutions to the energy crisis. To reduce oil prices, we can burst the speculative bubble by selling a half million barrels of oil per day from the full Strategic Petroleum Reserve. To help families, we should close oil company tax loopholes and recover lost royalties on oil and gas from federal waters, and return these funds to low- and middle-income households in a fuel price “relief bate” program. Speculators have increased oil prices by up to $30 per barrel, so the administration should make trades more transparent and increase the “margin” for speculators. In the long run, we must move beyond oil by investing in clean, sustainable biofuels such as cellulosic ethanol, require and promote super fuel-efficient cars, and shift tax incentives away from fossil fuels and toward clean alternative energy and efficiency. The real solution to the energy crisis—and to the climate crisis—is to innovate, become more efficient, and move forward. That’s why offshore drilling in sensitive areas is a bad idea. For a long-term plan, it is remarkably short-sighted.

### Link – Drilling

#### The US embargo prevents successful Cuban oil development

Benjamin-Alvadaro 06 (Jonathan, Report for the Cuban Research Institute, Florida International University, PhD, Professor of Political Science at University of Nebraska at Omaha, Director of the Intelligence Community Centers of Academic Excellence Program at UNO, Treasurer of the American Political Science Association, “The Current Status and Future Prospects for Oil Exploration in Cuba: A Special,” http://cri.fiu.edu/research/commissioned-reports/oil-cuba-alvarado.pdf)

But why has Sherritt succeeded when the perception on the part of many American observers has been that Cubans are difficult and mercurial partners? Sherritt Oil is a medium sized firm with medium sized aspirations that simultaneously seeks to produce a reasonable return on investment for its ventures in Cuba while operating a commercial enterprise that is working within a country in dire need of reliable energy sources that operates under the strictures of a command economy.8 This perhaps explains why Sherritt has been successful where others failed. The terms of “doing business” in Cuba are often too severe for conventional profit-seeking firms, but in this case, Sherritt appears to have altered its basis for success to coordinate its objectives with those available under the prevailing Cuban joint venture model. The Spanish oil firm, Repsol spent $53 million in oil and gas exploration in 2004 and came up with nothing and yet has contracted to continue exploration of 8 offshore tracks on the northwest coast of Cuba.9 It is also interesting that all, of the firms operating in Cuba at the present time are operating with dated technology and must be able to service all of its own exploration operations. This owes in part to the fact that American oil engineering represents the leading edge of oil exploration technology and explicit in all of its foreign sales are export control stipulations that none of that technology can be sold or transferred to a short but well known list of countries: Iraq; North Korea; until recently Libya; and of course, Cuba. This proscription adds up to 30 percent to the operating costs that what is still for Sherritt, and other joint venture partners, a profit making venture. Sherritt must also account for being largely responsible for providing all engineering support services as Cuba provides few of these services owing to the denial of technology on the part of the U.S. On this point, the U.S. embargo has been successful in relegating Cuba’s energy development schemes to a less than world class status. Moreover, it appears to have had a residual effect – as not to appear to be suffering from a technology gap, Cuba pursues upstream investment, such as the purchase of three drilling rigs from the Chinese for symbolic as well as practical reasons.10 Legitimately, given the existing resources on the island and interest from oil and gas exploration firms from Europe, Latin America and Canada, and especially because of Cuba’s cozy relationship with oil-rich Venezuela it is perhaps a questionable investment. American oil industry experts suggest that for a small country like Cuba, it could derive a greater benefit from investment in oil infrastructure such as pipelines, terminals, batteries, etc. These are the types of services essential to oil production and serve as revenue generating sources long after the reverie of an oil find. In an inherently risk driven industry it makes better sense for a small relatively resource constrained state to pursue this course of energy investment.

#### The embargo is a restriction on oil production

Edward J. Markey 11, Ranking Member, House Committee on Natural Resources, 11/2/11, “NORTH AMERICAN OFFSHORE ENERGY: MEXICO AND CANADA BOUNDARY TREATIES AND NEW DRILLING BY CUBA AND BAHAMAS,” http://www.gpo.gov/fdsys/pkg/CHRG-112hhrg71116/html/CHRG-112hhrg71116.htm

But who are the companies that are planning to drill in the waters off of Cuba, a mere 80 miles from Florida? They are the state-owned oil companies of Malaysia, Vietnam, Venezuela, and China. Because of a relic of the cold war, the Cuban embargo, American oil companies cannot drill in this area that could contain as much as 5 billion barrels of oil. The Majority has been so focused on a make-believe moratorium on drilling in the Gulf, that they've apparently missed the actual decades-long moratorium on American companies drilling off of Cuba that is the result of the embargo.

### Internal Link – Drilling Safety

#### Cuba cleanup and prevention technologies will fail

Captain Melissa Bert, USCG, 2011-2012 Military Fellow, U.S.Coast Guard, and Blake Clayton, Fellow for Energy and National Security; Addressing the Risk of a Cuban Oil Spill: http://www.cfr.org/cuba/addressing-risk-cuban-oil-spill/p27515; 2012

Deepwater drilling off the Cuban coast also poses a threat to the United States. The exploratory well is seventy miles off the Florida coast and lies at a depth of 5,800 feet. The failed Macondo well that triggered the calamitous Deepwater Horizon oil spill in April 2010 had broadly similar features, situated forty-eight miles from shore and approximately five thousand feet below sea level. A spill off Florida's coast could ravage the state's $57 billion per year tourism industry. Washington cannot count on the technical know-how of Cuba's unseasoned oil industry to address a spill on its own. Oil industry experts doubt that it has a strong understanding of how to prevent an offshore oil spill or stem a deep-water well blowout. Moreover, the site where the first wells will be drilled is a tough one for even seasoned response teams to operate in. Unlike the calm Gulf of Mexico, the surface currents in the area where Repsol will be drilling move at a brisk three to four knots, which would bring oil from Cuba's offshore wells to the Florida coast within six to ten days. Skimming or burning the oil may not be feasible in such fast-moving water. The most, and possibly only, effective method to respond to a spill would be surface and subsurface dispersants. If dispersants are not applied close to the source within four days after a spill, uncontained oil cannot be dispersed, burnt, or skimmed, which would render standard response technologies like containment booms ineffective.

## Venezuela

### Renewables 1NC

#### A. Unique Link – State control and lack of economic integration threatens Venezuelan Oil markets – further engagement is critical to renewed investment

Goldwyn, 2013 (David, President, Goldwyn Global Strategies, LLC, House Committee on Foreign Affairs; Subcommittee on the Western Hemisphere; “The Impact of the Tight Oil and Gas Boom on Latin America and the Caribbean: Opportunities for Cooperation”, April 11, http://docs.house.gov/meetings/FA/FA07/20130411/100622/HHRG-113-FA07-Wstate-GoldwynD-20130411.pdf)

The unconventional revolution will also force the resource-endowed nations of the Western Hemisphere to develop more competitive investment frameworks. North America has become the investment destination of choice, with large markets, attractive fiscal terms, strong rule of law and respect for contract sanctity in the U.S and Canada. As will be discussed in greater depth, many Latin American countries are noted for resource nationalism, volatile investment frameworks, and political extremes rather than stability. In order for Latin America to compete, investment terms will have to improve and regulatory frameworks must be enforced with equity and consistency. In short, the southern half of the Hemisphere must prove that it can adapt to changing markets, resource bases and technologies in order to compete with the opportunities found in North America. The prospects for this adaptation are mixed, providing opportunities for U.S. energy diplomacy. II. Energy Trends in the Western Hemisphere The Western Hemisphere has seen the rise of two trends in energy governance in recent years. One trend is towards rising state control of energy resources – in Venezuela, Argentina, Bolivia and Ecuador in particular. The concern here is that this trend will limit the growth of global supplies of oil and gas by undermining the value of existing investments, discouraging future investment and leading to political instability resulting from declining living standards. The economic consequence of this trend is that the hemisphere will contribute less to the diversification of oil supply, thereby engendering a tighter international oil market more vulnerable to the negative effects of supply shocks, increasing the importance of OPEC supply and, over time, undermining economic development in the region. The political consequences of these trends include the decline of U.S. influence in the region relative to competing ideologies and the erosion of democratic structures. A second, much more positive, trend is towards creative fiscal regimes that welcome foreign investment and require state owned companies to compete with international companies, with independent regulators that promote fair and efficient regulation. Countries observing this model are increasing production or stalling the decline of existing reserves. Colombia, Trinidad and Tobago, and Peru are key examples of this creative model. When I last testified on Latin American energy trends before Congress, Mexico was generally considered to be a part of the first group, making the net trend negative. Today, however, Mexico’s government is actively seeking reforms that include, but are certainly not limited to, the energy sector. A new question mark hangs over Brazil, however. While Petrobras had been viewed as an exemplar national oil company in recent years, it has recently seen its production estimates curtailed, and its market value tumble. The company is no longer second in value only to Exxon Mobil. Perhaps as a sign of changing regional dynamics, Petrobras is now reported to be worth less than Colombia’s national oil company, a development that would have been thought to be nearly unthinkable just a few years ago. 14 While natural gas production is rising, oil production is falling, as Petrobras has faced major challenges fulfill both its newfound responsibilities in the deep and ultra-deepwater subsalt resources, companies face challenges meeting aggressive local content requirements and Petrobras struggles to meet the political expectations of the government. Venezuela and Mexico are the most important oil exporters in the hemisphere. While Brazil, Colombia and Argentina are important destinations for foreign investment, and helpfully produce enough oil to meet their own domestic needs and make some contribution to the global export market, they are not strategic suppliers to the global market at this time. Only Mexico, Brazil and Venezuela produce more than a million barrels per day, although Colombian crude oil production rose as high as 944,310 barrels per day in 2012,15 and Federico Renjifo, the Colombian Energy and Mining Minister, has stated that the country expects to produce 1.01 mbd in 2013. 16 Bolivia has enormous gas reserves, but exports mostly to Brazil and modestly to Argentina. Only Trinidad and Tobago is a key supplier to the world gas market. A. The Rise in State Control From those countries now committed to increasing state control, the U.S. faces two key challenges: the loss of production growth and diversity of supply from the region if new economic frameworks are unattractive to foreign investors and, most critically, the loss of U.S. influence vis-à-vis competing political visions. The Economic Impact of Rising State Control The recent wave of changes in contractual terms and dramatic changes in tax regimes in Venezuela, Bolivia, Ecuador and, in recent years, Argentina, threatens to slow new investment and eventually deepen instability and poverty in these nations, as well as destroy shareholder value for the companies invested there. The deterioration in the investment climate for energy in these countries is primarily an economic threat, as it foments an environment where supply is constrained and prices are high. We are seeing the revision of economic terms at a time when producers rather than companies hold more market power.

#### And, Renewable Energy is winning the investment race

American Council On Renewable Energy (ACORE), California Clean Energy Fund (CalCEF), and Climate Policy Initiative 6/25 (ACORE, a 501(c)(3) non-profit membership organization, is dedicated to building a secure and prosperous America with clean, renewable energy. ACORE provides a common educational platform for a wide range of interests in the renewable energy community, focusing on technology, finance and policy. We convene thought leadership forums and create energy industry partnerships to communicate the economic, security and environmental benefits of renewable energy. Founded in 2004, the California Clean Energy Fund (CalCEF) is a family of non-profit organizations working together to accelerate the movement of clean energy technologies along the continuum from innovation to infrastructure. Using tools from finance, public policy and technological innovation, CalCEF pursues these goals at the local, state and national levels via three affiliated entities: CalCEF Ventures, an evergreen investment fund; CalCEF Innovations, which leads CalCEF’s analysis and solutions development; and CalCEF Catalyst, an industry acceleration platform. Climate Policy Initiative is an analysis and advisory organization that works to improve the most important energy and land use policies in the world. An independent, not-for-profit organization supported in part by a grant from the Open Society Foundations, CPI has offices and programs in Brazil, China, Europe, India, Indonesia, and the United States. “Strategies to Scale-Up U.S. Renewable Energy Investment” http://www.oregonwave.org/wp-content/uploads/Strategies-to-Scale-Up-US-Renewable-Energy-Investment.pdf)

Private sector investment in the U.S. renewable energy sector has grown significantly in recent years due in large part to manufacturing and technology cost reductions, state market demand policies, and federal tax policies. The combination of these factors has contributed to impressive growth for the renewable energy industry, and this scale in turn has further reduced technology costs. Over the past five years, more than 35% of all new power generation has come from renewable energy resources, including more than 49% of all new power generation in 2012 – surpassing all other energy sources, including natural gas. Since 2004, more than $300 billion has been invested in the U.S. clean energy market (PREF), including $35.6 billion6 in 2012, with a corresponding significant increase in jobs. Renewable energy generation also enhances energy security by harnessing clean domestic resources to produce more of the energy we consume here in the United States.

#### B. Internal Link – Reliance on oil production crushes the transition to renewables

CBO, 2012 (Congressional Budget Office, “Energy Security in the United States”, May, http://www.cbo.gov/sites/default/files/cbofiles/attachments/05-09-EnergySecurity.pdf)

Even if world oil prices declined as a result of increased U.S. production, most households and businesses would not be substantially less vulnerable to future oil disruptions, for two reasons. First, an expectation by consumers of sustained lower prices would provide an incentive for households and businesses to make long-run decisions— that is, decisions that cannot easily be reversed in the near term—that ultimately increased their reliance on oil. For example, a reduction in gasoline prices would decrease the cost of using less-fuel-efficient vehicles or living far from work. Similarly, if industries expected lower oil prices, they would have less incentive to develop alternative fuel supplies (such as natural gas or electricity) for personal or public transportation. As a result, lower prices might induce households and businesses to increase their reliance on oil in the transportation sector and, thus, increase their exposure to disruptions in the supply of oil. Second, even though oil prices might be slightly lower if oil production was increased, a reduction in cost of a few dollars per barrel would be small compared with the price fluctuations that are common to the oil market. Between 2001 and 2011, price changes of $60 to $90 per barrel of oil occurred. Thus, increased domestic production would leave the vulnerability of most consumers to disruptions in oil markets largely unchanged.38

**C. Impact – Renewable Transition is critical to solve global warming**

**Leahy, ’11** (Stephen, Independent environmental journalist for 16 years, “Permafrost Melt Soon Irreversible Without Major Fossil Fuel Cuts”, Feb 21, http://www.countercurrents.org/leahy210911.htm)

UXBRIDGE - Thawing permafrost is threatening to overwhelm attempts to keep the planet from getting **too hot for** human **survival.** Without major reductions in the use of fossil fuels, as much as two-thirds of the world's gigantic storehouse of frozen carbon could be released, a new study reported. That would push global temperatures several degrees higher, making large parts of the planet **uninhabitable**. Once the Arctic gets warm enough, the carbon and methane emissions from thawing permafrost will kick-start a feedback that will **amplify the current warming rate,** says Kevin Schaefer, a scientist at the National Snow and Ice Data Center (NSIDC) in Boulder, Colorado. That will likely be **irreversible**. And **we're less than 20 years from this tipping point**. Schaefer prefers to use the term "starting point" for when the 13 million square kilometres of permafrost in Alaska, Canada, Siberia and parts of Europe becomes a major new source of carbon emissions. "Our model projects a starting point 15 to 20 years from now," Schaefer told IPS. The model used a 'middle of the road' scenario with less fossil fuel use than at present. Even at that rate, it found that between 29 and 60 percent of the world's permafrost will thaw, releasing an extra 190 gigatonnes of carbon by 2200. The study is the first to quantify when and how much carbon will be released and was published this week in the meteorological journal Tellus. "The amount of carbon released is equivalent to half the amount of carbon that has been released into the atmosphere since the dawn of the industrial age," Schaefer said. The additional carbon from permafrost would increase the average temperatures in the Arctic by **eight to 10 degrees C**, the study reported. Not only would this utterly transform the Arctic, it would also increase the planet's average temperature by about three degrees C, agrees Schaefer. And this increase would be on top of the three to six degrees C from continuing to burn fossil fuels over the next 100 years. The Earth's normal average temperature is 14C, so heating up the entire planet another six to nine degrees C would be like increasing our body temperatures from the normal 37C to a deadly fever of 53 to 60 degrees C. As catastrophic as all this is, Schaefer acknowledges his study underestimates what is likely to happen. The model does not measure methane releases, which are 40 times as potent in terms of warming as carbon. Methane could have a big impact on temperatures in the short term, he says. "There would be a lot of methane emissions. We're working on estimating those right now," he said. The model also does not include emissions from the large region of underwater permafrost. IPS previously reported that an estimated eight million tonnes of methane emissions are bubbling to the surface from the shallow East Siberian Arctic shelf every year. If just one percent of the Arctic undersea methane (also called methane hydrates) reaches the atmosphere, it could quadruple the amount of methane currently in the atmosphere, Vladimir Romanovsky of the University of Alaska in Fairbanks previously told IPS. Nor does the model account for a process called thermokarst erosion, acknowledges Schaefer. This is a widely observed process where meltwater erodes the permafrost and exposes it to warmer temperatures and speeding up the thaw. "We can't model that yet but it could contribute to major releases of carbon and methane," he said. None of this has been taken into account by politicians and policy makers looking to cut humanity's carbon emissions with the agreed on target of keeping global temperatures below two degrees C. Nor is there a wide appreciation for the fact there is no 'reverse gear'. Even if all fossil fuel use stopped today, global temperatures would continue to rise and permafrost would thaw for another 20 to 30 years, Schaefer estimates. And once the permafrost carbon is released, "there is no way to put it back into the permafrost". Even if there was a way to lower the Earth's human-induced fever, it would take a century or more for thawed permafrost to reform, he said. Permafrost has been warming and thawing since the 1980s. A 2009 study reported that the southernmost permafrost limit had retreated 130 kilometres over the past 50 years in Quebec's James Bay region. The major loss of sea ice in the Arctic allows the Arctic Ocean to become much warmer, which in turn has increased temperatures of coastal regions an average of three to five degrees C warmer than 30 years ago. More ominously, large parts of the eastern Arctic were 21C higher above normal for a month in the dead of winter this year, as previously reported by IPS. However, while on the edge of a most dangerous precipice, there is a safer path available. A new energy analysis demonstrates that fossil fuel energy could be virtually phased out by 2050 while offering comfortable lifestyles for all. The Energy Report by Ecofys, a leading energy consulting firm in the Netherlands, shows that humanity could meet 95 percent of energy needs with renewables utilising today's technologies. "The Energy Report shows that in four decades we can have a world of vibrant economies and societies powered entirely by clean, cheap and renewable energy and with a vastly improved quality of life," said WWF Director General Jim Leape. WWF worked on the report with Ecofys. "The report is more than a scenario – it's a call for action. We can achieve a cleaner, renewable future, **but we must start now,**" Leape said in a statement.

#### And, Positive feedbacks ensure runaway warming, causes extinction

Speth 2008[James, dean of the Yale School of Forestry and Environmental Studies at Yale University, New Haven, Connecticut. Currently he serves the school as the Carl W. Knobloch, Jr. Dean and Sara Shallenberger Brown Professor in the Practice of Environmental Policy, The Bridge @ the Edge of the World, pg. 26]

The possibility of abrupt climate change is linked to what may be the most problematic possibility of all—"positive" feedback effects where the initial warming has effects that generate more warming. Several of these feedbacks are possible. First, the land's ability to store carbon could weaken. Soils and forests can dry out or burn and release carbon; less plant growth can occur, thus reducing nature's ability to remove carbon from the air. Second, carbon sinks in the oceans could also be reduced due to ocean warming and other factors. Third, the potent greenhouse gas methane could be released from peat bogs, wetlands, and thawing permafrost, and even from the methane hydrates in the oceans, as the planet warms and changes. Finally, the earth's albedo, the reflectivity of the earth's surface, is slated to be reduced as large areas now covered by ice and snow diminish or are covered by meltwater. All these effects would tend to make warming self-reinforcing, possibly leading to a greatly amplified greenhouse effect. The real possibility of these amplifying feedbacks has alarmed some of our top scientists. James Hansen, the courageous NASA climate scientist, is becoming increasingly outspoken as his investigations lead him to more and more disturbing conclusions. He offered the following assessment in 2007: "Our home planet is now dangerously near a 'tipping point.' Human-made greenhouse gases are near a level such that important climate changes may proceed mostly under the climate system's own momentum. Impacts would include extermination of a large fraction of species on the planet, shifting of climatic zones due to an intensified hydrologic cycle with effects on freshwater availability and human health, and repeated worldwide coastal tragedies associated with storms and a continuously rising sea level. .. . "Civilization developed during the Holocene, a period of relatively tranquil climate now almost 12,000 years in duration. The planet has been warm enough to keep ice sheets off North America and Europe, but cool enough for ice sheets on Greenland and Antarctica to be stable. Now, with rapid warming of o.6°C in the past 30 years, global temperature is at its warmest level in the Holocene. "This warming has brought us to the precipice of a great 'tipping point” If we go over the edge, it will be a transition to 'a different planet,' an environment far outside the range that has been experienced by humanity. There will be no return within the lifetime of any generation that can be imagined, and the trip will exterminate a large fraction of species on the planet.

### Uniqueness – Production

#### Venezuelan oil production is stagnating – outside investment key to restart the Venezuelan oil sector

Goldwyn, 2013 (David, President, Goldwyn Global Strategies, LLC, House Committee on Foreign Affairs; Subcommittee on the Western Hemisphere; “The Impact of the Tight Oil and Gas Boom on Latin America and the Caribbean: Opportunities for Cooperation”, April 11, http://docs.house.gov/meetings/FA/FA07/20130411/100622/HHRG-113-FA07-Wstate-GoldwynD-20130411.pdf)

Venezuela In 2007, President Hugo Chavez led the nationalization of oil exploration and production in Venezuela, mandating renegotiation of contracts with a minimum 60 percent PdVSA share. While sixteen companies, including Shell and Chevron, complied with the new agreements, ExxonMobil and ENI refused to cooperate and were forcibly taken over. Both companies have pending complaints before the International Centre for the Settlement of Investment Disputes (ICSID) at the World Bank that are expected to be decided in late 2013. As a result of those claims, particularly the ExxonMobil claim, Venezuela withdrew from the ICSID in 2012.17 The impact of the nationalizations, according to expert analysts like Deutsche Bank and Wood Mackenzie, was a massive flight of investment capital from Venezuela’s heavy oil sector to Canada’s oil sands, effectively freezing development of the hemisphere’s largest oil reserves during one of the greatest oil booms in history. The net impact on Venezuela’s credit and credibility are quite negative, again with serious negative long-term consequences for the global oil market and Venezuela’s own economy. In 2008, ENI and Total came reached an agreement with PdVSA regarding a 2005 joint venture requirement that they had not previously signed an MOU for. Terms for involvement in natural gas development in Venezuela are slightly more beneficial, although in 2012, the year before his death, President Chavez expressed some interest in altering those terms. It is generally expected that Venezuela’s oil production will continue to fluctuate or stagnate without considerable outside investment. According to the EIA, some analysts estimate that PdVSA must spend at least $3 billion annually in order to keep production at its current levels.18 Venezuela plays a significant role in the Western Hemisphere, acting as a proxy for Cuba and providing oil at favorable cost and financing terms to Caribbean nations through Petrocaribe and the Southern Cone through Petrosur, ventures which add stress to the country’s fiscal situation. While change is unlikely to happen quickly, pressure stemming from the recent failed currency devaluation, rising inflation, and vast external subsidies will take a toll on the economy and are ultimately unsustainable.

#### **Venezuelan oil production falling**

HispanicBusiness 13

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http://www.hispanicbusiness.com/2013/1/20/what\_happens\_to\_venezuelan\_oil\_when.htm

Venezuela also will need to tackle its declining oil production and lack of foreign investment regardless of whether the Chavistas or the opposition take over, Tissot said. Chavez fired thousands of oil managers and workers after a 2002 strike that sought his resignation, and he later nationalized the assets of companies like Exxon and ConocoPhillips. Crude oil production in Venezuela has dropped by about a quarter since 2001, according to data from the U.S. Department of Energy. The industry also suffers from a deteriorating refinery system and accidents, including an explosion that killed at least 41 people in August. Venezuela a decade ago exported gasoline to other nations, including the United States. Now Venezuela imports U.S. gasoline, bringing in a record 196,000 barrels a day of petroleum products in September.

#### Oil industry collapsing under Maduro

Negroponte 13

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http://www.brookings.edu/blogs/up-front/posts/2013/04/16-venezuela-maduro-negroponte

With oil production down from 3.3 million barrels per day (mbd) to 2.4 mbd and a $42.5 billion debt to the China Development Bank (CDB), Maduro will face a shortage of cash. He can persuade Venezuelans that they should tighten their belts and endure a period of austerity, but that could provoke protest from the very constituency who supported his election. He could approach the multilateral banks, but Chavez rejected these institutions as being tools of the U.S. “empire.” Maduro’s supporters in Cuba are reliant on the continued provision of 90,000 barrels per day of subsidized oil to the island, preventing him from drawing down that account to sell the oil on the open market. Maduro has two options: seek a further loan from CDB, similar to the $12 billion that Chavez obtained in June 2011, or renegotiate the repayment terms on the current Chinese loans. (Currently 21 percent of Venezuela’s debt goes to Chinese institutions.) The Chinese government response is critical.

## Mexico

### Renewables 1NC

#### A. Uniqueness – Mexico’s oil production is tanking

Krauss and Malkin ’10 (“Mexico Oil Politics Keeps Riches Just Out of Reach” New York Times, Clifford Krauss and Elisabeth Malkin, March 8, 2010 http://www.nytimes.com/2010/03/09/business/global/09pemex.html?pagewanted=all&\_r=0)

In all, Mexican oil output has dropped from just short of 3.5 million barrels a day in 2004 to a projected average of 2.5 million barrels this year. Mexican oil exports to the United States, now 1.1 million barrels a day, have fallen by nearly a third in the last six years. The United States Energy Department projects that Mexican production will decline by an additional 600,000 barrels a day by 2020; combined with growing domestic demand, that would probably make the country an oil importer. In the last two years, Mexico provided about 12 percent of all crude oil imports to the United States, supplying about 8 percent of the total oil used by American refineries, according to the Energy Department. Pemex — officially Petróleos Mexicanos — is the most important company in Mexico, employing 140,000 people. Oil money is used for everything from building schools to fighting the war against drug cartels. “The fact that Mexico’s production is rapidly declining could potentially cause a financial crisis not only for Pemex but for the government,” said Enrique Sira, the Mexico director of IHS Cera, an energy consulting firm. Mexican officials put the best face on the situation, hailing a reform package passed by Congress two years ago that gives Pemex more independence and leeway in negotiating service contracts with foreign firms. “There is nothing to stop us from improving,” Pemex’s director general, Juan José Suárez Coppel, said at a recent university conference. In an interview, the Mexican energy secretary, Georgina Kessel, said she expected the drop in oil production to level off this year, “and we can begin on the road back toward reversing the fall in production in the coming years.” To accomplish that, Ms. Kessel said, “Mexico is going to have to go to the deep waters of the Gulf of Mexico,” where she estimated there are at least 50 billion barrels in potential oil reserves — more than double the country’s current proven reserves. International oil executives share the enthusiasm for Mexico’s potential deepwater fields, which lie near rich new American fields. Mexico “potentially has, if not the largest, one of the largest undiscovered deepwater petroleum resources in the world,” said Jon Blickwede, a senior geologist at Statoil, a Norwegian oil company active in the Gulf. Pemex has stepped up exploration of its deep waters, but it will take specialized expertise and enormous financing to produce oil there. Just one deepwater rig can cost $365 million a year to operate, which is why even companies the size of Chevron and Shell look for partners to share the financial risk. Carlos Morales, head of Pemex production and exploration, said in an interview that the company was in advanced discussions with foreign companies to develop “new models” of contracts to share costs and technology on land and offshore that would include cash payments. “Without doubt, Pemex is in a key moment in its history,” he said. Like the government, international oil executives said they were cautiously optimistic some arrangement with Pemex could be worked out. But in the best case, it will be 10 or 15 years before significant production can begin in the deep gulf — and by then, Mexico could already be an oil importer. Stumbling blocks remain. The recent reforms do not lift constitutional prohibitions that effectively prevent foreign companies from booking Mexican reserves they help discover, which undermines their incentive to sign deals with Pemex. The Mexican government hopes to interpret the new rules to allow foreign firms to share the profits of new discoveries, but opposition political parties have filed a constitutional challenge to the rules. The case is before the Mexican Supreme Court. The 1938 nationalization, by the leftist government of Lázaro Cárdenas, came at the end of a long period of revolutionary ferment in Mexico. It occurred amid rising tensions between foreign oil interests, including American companies, and Mexican workers who felt they were being exploited. Schoolchildren learn about it as one of the great assertions of Mexican sovereignty. An outright reversal of that act is unthinkable in Mexican politics. Carlos Fuentes, the Mexican novelist and former ambassador, said any government leader who would try to change the legal status of oil “would be hanged in the Zócalo,” referring to Mexico City’s main square, though he personally would like to see some arrangement with foreign oil companies worked out. As a symbol of nationalism and sovereignty, Pemex is run like a government agency, not an oil company. Its budget is set by the Congress, so it cannot plan exploration far in advance. It is burdened by taxes, debt and pension liabilities that limit its ability to spend money discovering new fields. Mexico’s most important field has long been Cantarell. When production first faltered in the late 1990s, Pemex injected huge amounts of nitrogen gas to raise the pressure and increase production. But experts say the company may have gone overboard, bolstering production so much that the eventual collapse was accelerated. With production in deep gulf waters still a distant dream, the hope of stabilizing Mexico’s production has centered on the Chicontepec field here, on land. But Pemex’s production forecast, of up to 700,000 barrels a day by 2017, has evaporated as hole after hole came up dry. Chicontepec is now yielding only 35,000 barrels a day. The oil is contained in small pockets, and wet, hilly terrain makes it difficult to transport gear. Local corn farmers are slowing the drilling by blockading roads, demanding improvements like parks and pavement. “The oil is down there,” said Sergio Gómez, the Pemex production coordinator in Chicontepec. “The problem is getting it out of the ground.”

#### And, Renewable Energy is winning the investment race

American Council On Renewable Energy (ACORE), California Clean Energy Fund (CalCEF), and Climate Policy Initiative 6/25 (ACORE, a 501(c)(3) non-profit membership organization, is dedicated to building a secure and prosperous America with clean, renewable energy. ACORE provides a common educational platform for a wide range of interests in the renewable energy community, focusing on technology, finance and policy. We convene thought leadership forums and create energy industry partnerships to communicate the economic, security and environmental benefits of renewable energy. Founded in 2004, the California Clean Energy Fund (CalCEF) is a family of non-profit organizations working together to accelerate the movement of clean energy technologies along the continuum from innovation to infrastructure. Using tools from finance, public policy and technological innovation, CalCEF pursues these goals at the local, state and national levels via three affiliated entities: CalCEF Ventures, an evergreen investment fund; CalCEF Innovations, which leads CalCEF’s analysis and solutions development; and CalCEF Catalyst, an industry acceleration platform. Climate Policy Initiative is an analysis and advisory organization that works to improve the most important energy and land use policies in the world. An independent, not-for-profit organization supported in part by a grant from the Open Society Foundations, CPI has offices and programs in Brazil, China, Europe, India, Indonesia, and the United States. “Strategies to Scale-Up U.S. Renewable Energy Investment” http://www.oregonwave.org/wp-content/uploads/Strategies-to-Scale-Up-US-Renewable-Energy-Investment.pdf)

Private sector investment in the U.S. renewable energy sector has grown significantly in recent years due in large part to manufacturing and technology cost reductions, state market demand policies, and federal tax policies. The combination of these factors has contributed to impressive growth for the renewable energy industry, and this scale in turn has further reduced technology costs. Over the past five years, more than 35% of all new power generation has come from renewable energy resources, including more than 49% of all new power generation in 2012 – surpassing all other energy sources, including natural gas. Since 2004, more than $300 billion has been invested in the U.S. clean energy market (PREF), including $35.6 billion6 in 2012, with a corresponding significant increase in jobs. Renewable energy generation also enhances energy security by harnessing clean domestic resources to produce more of the energy we consume here in the United States.

#### B. Link – Expanded US/Mexico cooperation increases our dependence on Oil

Krauss and Malkin ’10 (“Mexico Oil Politics Keeps Riches Just Out of Reach” New York Times, Clifford Krauss and Elisabeth Malkin, March 8, 2010 http://www.nytimes.com/2010/03/09/business/global/09pemex.html?pagewanted=all&\_r=0)

To the Mexican people, one of the great achievements in their history was the day their president kicked out foreign oil companies in 1938. Thus, they celebrate March 18 as a civic holiday. The effort to develop the geologically challenging Chicontepec field is deteriorating into an embarrassing setback for Pemex. Georgina Kessel, the energy secretary, estimated there are 50 billion barrels in potential oil reserves in the Gulf of Mexico. Yet today, that 72-year-old act has put Mexico in a straitjacket, one that threatens both the welfare of the country and the oil supply of the United States. The national oil company created after the 1938 seizure, Pemex, is entering a period of turmoil. Oil production in its aging fields is sagging so rapidly that Mexico, long one of the world’s top oil-exporting countries, could begin importing oil within the decade. Mexico is among the three leading foreign suppliers of oil to the United States, along with Canada and Saudi Arabia. Mexican barrels can be replaced, but at a cost. It means greater American dependence on unfriendly countries like Venezuela, unstable countries like Nigeria and Iraq, and on the oil sands of Canada, an environmentally destructive form of oil production. “As you lose Mexican oil, you lose a critical supply,” said Jeremy M. Martin, director of the energy program at the Institute of the Americas at the University of California, San Diego. “It’s not just about energy security but national security, because our neighbor’s economic and political well-being is largely linked to its capacity to produce and export oil.” Mexico probably still has plenty of oil, especially beneath the deep waters of the Gulf of Mexico, but Pemex lacks the technology and know-how to get it out. Inviting foreign companies into the country to help is one of the touchiest propositions in Mexican politics. As the Mexican government struggles to find a way forward, production keeps falling. The basic problem is simply that Mexico’s readily accessible oil is used up — pretty much the same thing that happened to the United States when production began falling in the 1970s. Output from Mexico’s giant Cantarell field, in shallow waters near the eastern shore, has plunged by 50 percent in recent years. Output at the country’s other large field is expected to begin falling in the next year or two. Historically, oil has supplied 30 to 40 percent of the Mexican government’s revenue. Confronting a potential calamity, President Felipe Calderón has pushed through the strongest reforms he can defend politically, in hopes of attracting foreign investment. But he dare not do anything that would appear to reverse the 1938 nationalization. Even the modest reforms he has managed to pass are being challenged in court. Officially, the government is optimistic that Mexico can reverse its decline as an oil-producing nation. But its efforts so far have yielded more rhetoric than oil. Last year, on the day celebrating the 1938 seizure, the president’s helicopter landed in a hilly oil field outside this farming town. He announced that a new era of Mexican gushers would dawn soon. “Under this soil,” Mr. Calderón told thousands of oil workers, lay “the richness that could propel development in our country and help Mexico accelerate our path to progress and well-being.” He promised that 20 wells would be spurting crude “very soon” from the ground on which he stood. Almost a year later, only three wells were pumping on a recent afternoon. Eleven had been shut after producing little or no oil. In fact, the effort to develop the geologically challenging Chicontepec field here, near the gulf coast, is deteriorating into an embarrassing disaster for Pemex, the latest in a string of them.

#### C. Internal Link – Reliance on oil production crushes the transition to renewables

CBO, 2012 (Congressional Budget Office, “Energy Security in the United States”, May, http://www.cbo.gov/sites/default/files/cbofiles/attachments/05-09-EnergySecurity.pdf)

Even if world oil prices declined as a result of increased U.S. production, most households and businesses would not be substantially less vulnerable to future oil disruptions, for two reasons. First, an expectation by consumers of sustained lower prices would provide an incentive for households and businesses to make long-run decisions— that is, decisions that cannot easily be reversed in the near term—that ultimately increased their reliance on oil. For example, a reduction in gasoline prices would decrease the cost of using less-fuel-efficient vehicles or living far from work. Similarly, if industries expected lower oil prices, they would have less incentive to develop alternative fuel supplies (such as natural gas or electricity) for personal or public transportation. As a result, lower prices might induce households and businesses to increase their reliance on oil in the transportation sector and, thus, increase their exposure to disruptions in the supply of oil. Second, even though oil prices might be slightly lower if oil production was increased, a reduction in cost of a few dollars per barrel would be small compared with the price fluctuations that are common to the oil market. Between 2001 and 2011, price changes of $60 to $90 per barrel of oil occurred. Thus, increased domestic production would leave the vulnerability of most consumers to disruptions in oil markets largely unchanged.38

**D. Impact – Renewable Transition is critical to solve global warming**

**Leahy, ’11** (Stephen, Independent environmental journalist for 16 years, “Permafrost Melt Soon Irreversible Without Major Fossil Fuel Cuts”, Feb 21, http://www.countercurrents.org/leahy210911.htm)

UXBRIDGE - Thawing permafrost is threatening to overwhelm attempts to keep the planet from getting **too hot for** human **survival.** Without major reductions in the use of fossil fuels, as much as two-thirds of the world's gigantic storehouse of frozen carbon could be released, a new study reported. That would push global temperatures several degrees higher, making large parts of the planet **uninhabitable**. Once the Arctic gets warm enough, the carbon and methane emissions from thawing permafrost will kick-start a feedback that will **amplify the current warming rate,** says Kevin Schaefer, a scientist at the National Snow and Ice Data Center (NSIDC) in Boulder, Colorado. That will likely be **irreversible**. And **we're less than 20 years from this tipping point**. Schaefer prefers to use the term "starting point" for when the 13 million square kilometres of permafrost in Alaska, Canada, Siberia and parts of Europe becomes a major new source of carbon emissions. "Our model projects a starting point 15 to 20 years from now," Schaefer told IPS. The model used a 'middle of the road' scenario with less fossil fuel use than at present. Even at that rate, it found that between 29 and 60 percent of the world's permafrost will thaw, releasing an extra 190 gigatonnes of carbon by 2200. The study is the first to quantify when and how much carbon will be released and was published this week in the meteorological journal Tellus. "The amount of carbon released is equivalent to half the amount of carbon that has been released into the atmosphere since the dawn of the industrial age," Schaefer said. The additional carbon from permafrost would increase the average temperatures in the Arctic by **eight to 10 degrees C**, the study reported. Not only would this utterly transform the Arctic, it would also increase the planet's average temperature by about three degrees C, agrees Schaefer. And this increase would be on top of the three to six degrees C from continuing to burn fossil fuels over the next 100 years. The Earth's normal average temperature is 14C, so heating up the entire planet another six to nine degrees C would be like increasing our body temperatures from the normal 37C to a deadly fever of 53 to 60 degrees C. As catastrophic as all this is, Schaefer acknowledges his study underestimates what is likely to happen. The model does not measure methane releases, which are 40 times as potent in terms of warming as carbon. Methane could have a big impact on temperatures in the short term, he says. "There would be a lot of methane emissions. We're working on estimating those right now," he said. The model also does not include emissions from the large region of underwater permafrost. IPS previously reported that an estimated eight million tonnes of methane emissions are bubbling to the surface from the shallow East Siberian Arctic shelf every year. If just one percent of the Arctic undersea methane (also called methane hydrates) reaches the atmosphere, it could quadruple the amount of methane currently in the atmosphere, Vladimir Romanovsky of the University of Alaska in Fairbanks previously told IPS. Nor does the model account for a process called thermokarst erosion, acknowledges Schaefer. This is a widely observed process where meltwater erodes the permafrost and exposes it to warmer temperatures and speeding up the thaw. "We can't model that yet but it could contribute to major releases of carbon and methane," he said. None of this has been taken into account by politicians and policy makers looking to cut humanity's carbon emissions with the agreed on target of keeping global temperatures below two degrees C. Nor is there a wide appreciation for the fact there is no 'reverse gear'. Even if all fossil fuel use stopped today, global temperatures would continue to rise and permafrost would thaw for another 20 to 30 years, Schaefer estimates. And once the permafrost carbon is released, "there is no way to put it back into the permafrost". Even if there was a way to lower the Earth's human-induced fever, it would take a century or more for thawed permafrost to reform, he said. Permafrost has been warming and thawing since the 1980s. A 2009 study reported that the southernmost permafrost limit had retreated 130 kilometres over the past 50 years in Quebec's James Bay region. The major loss of sea ice in the Arctic allows the Arctic Ocean to become much warmer, which in turn has increased temperatures of coastal regions an average of three to five degrees C warmer than 30 years ago. More ominously, large parts of the eastern Arctic were 21C higher above normal for a month in the dead of winter this year, as previously reported by IPS. However, while on the edge of a most dangerous precipice, there is a safer path available. A new energy analysis demonstrates that fossil fuel energy could be virtually phased out by 2050 while offering comfortable lifestyles for all. The Energy Report by Ecofys, a leading energy consulting firm in the Netherlands, shows that humanity could meet 95 percent of energy needs with renewables utilising today's technologies. "The Energy Report shows that in four decades we can have a world of vibrant economies and societies powered entirely by clean, cheap and renewable energy and with a vastly improved quality of life," said WWF Director General Jim Leape. WWF worked on the report with Ecofys. "The report is more than a scenario – it's a call for action. We can achieve a cleaner, renewable future, **but we must start now,**" Leape said in a statement.

#### And, Positive feedbacks ensure runaway warming, causes extinction

Speth 2008[James, dean of the Yale School of Forestry and Environmental Studies at Yale University, New Haven, Connecticut. Currently he serves the school as the Carl W. Knobloch, Jr. Dean and Sara Shallenberger Brown Professor in the Practice of Environmental Policy, The Bridge @ the Edge of the World, pg. 26]

The possibility of abrupt climate change is linked to what may be the most problematic possibility of all—"positive" feedback effects where the initial warming has effects that generate more warming. Several of these feedbacks are possible. First, the land's ability to store carbon could weaken. Soils and forests can dry out or burn and release carbon; less plant growth can occur, thus reducing nature's ability to remove carbon from the air. Second, carbon sinks in the oceans could also be reduced due to ocean warming and other factors. Third, the potent greenhouse gas methane could be released from peat bogs, wetlands, and thawing permafrost, and even from the methane hydrates in the oceans, as the planet warms and changes. Finally, the earth's albedo, the reflectivity of the earth's surface, is slated to be reduced as large areas now covered by ice and snow diminish or are covered by meltwater. All these effects would tend to make warming self-reinforcing, possibly leading to a greatly amplified greenhouse effect. The real possibility of these amplifying feedbacks has alarmed some of our top scientists. James Hansen, the courageous NASA climate scientist, is becoming increasingly outspoken as his investigations lead him to more and more disturbing conclusions. He offered the following assessment in 2007: "Our home planet is now dangerously near a 'tipping point.' Human-made greenhouse gases are near a level such that important climate changes may proceed mostly under the climate system's own momentum. Impacts would include extermination of a large fraction of species on the planet, shifting of climatic zones due to an intensified hydrologic cycle with effects on freshwater availability and human health, and repeated worldwide coastal tragedies associated with storms and a continuously rising sea level. .. . "Civilization developed during the Holocene, a period of relatively tranquil climate now almost 12,000 years in duration. The planet has been warm enough to keep ice sheets off North America and Europe, but cool enough for ice sheets on Greenland and Antarctica to be stable. Now, with rapid warming of o.6°C in the past 30 years, global temperature is at its warmest level in the Holocene. "This warming has brought us to the precipice of a great 'tipping point” If we go over the edge, it will be a transition to 'a different planet,' an environment far outside the range that has been experienced by humanity. There will be no return within the lifetime of any generation that can be imagined, and the trip will exterminate a large fraction of species on the planet.

### Uniqueness – Production

#### Mexico is suffering an energy crisis now – US action is key

Reuters, 5/8/08 (“UPDATE 1-Mexico warns of energy crisis without overhaul” Reuters, May 8, 2008,

http://www.reuters.com/article/2008/05/08/mexico-energy-idUSN0836827120080508)

Mexico will suffer a severe energy crisis before 2018 unless the oil sector is overhauled, Mexican Energy Minister Georgina Kessel warned on Thursday. President Felipe Calderon unveiled a proposal last month to let private companies participate more in the energy industry to stave off falling oil production. But the plan has met stiff opposition from leftists, who say the government wants to hand over state oil monopoly Pemex to investors. Mexicans are passionately protective of Pemex, which finances a third of government spending but lacks funds for exploration. "If we don't do anything, Mexico will face a severe energy crisis before the next presidential administration ends (in 2018)," Kessel told lawmakers. After leftist lawmakers held sit-ins in Congress to protest the proposal, the government agreed to hold more than two months of debate about the future of the oil sector. Aimed at shoring up flagging output and reserves in the world's No. 6 oil producer, Calderon's proposal would let Pemex sweeten oil field service contracts with private companies using performance-based bonuses. Critics say that would violate a ban on private companies exploring for and producing oil in Mexico

### Link – Infrastructure

#### Expanded US/Mexico infrastructure boosts energy investment and oil production

Handley ’13 (Meg Handley, Reporter for U.S. News & World Report, “Infrastructure Upgrades Needed to Fuel Domestic Energy Boom”, February 22, 2013)

In this June 27, 2012 file photo, ships bringing oil drilling equipment to Alaska, left, pass through Seattle's Elliott Bay as a Washington State Ferry passes on its way into Seattle. Ships bring oil drilling equipment to Alaska. The lack of infrastructure in the U.S. is leading some oil companies to ship products by rail, but experts say a pipeline is the most efficient way to transport oil and gas. Much has been said of the potential for the United States to become energy independent thanks to the recent boom in domestic energy production. But according to experts, growth in the industry could be stunted without serious expansion in the nation's network of pipelines and other energy infrastructure. While Quinn Kiley, senior portfolio manager at FAMCO MLP, a division of Advisory Research Inc., characterizes advances in the country's infrastructure as "industry and global leading," he says the nation needs to bring additional pipeline capacity online to keep up with the growing domestic production and potential imports flowing from Canada and Mexico. "If you have new and growing production, you need additional infrastructure whether it's from the oil sands or the Bakken Shale," says Kiley, whose firm specializes in energy infrastructure investing. "Today you have a lot of that crude [oil] coming at a very disjointed, nonlinear path to get to where it needs to go." "There's going to be a time where supply is going to outstrip the existing infrastructure and you're going to have to fill that in," Kiley adds. According to Darren Schuringa, the price tag for all the infrastructure improvements needed for the United States to achieve energy independence amounts to around $300 billion over the next decade or so, no small sum considering the still-shaky ground on which the U.S. economy sits. Still, they are key investments to make, argues Schuringa, founder of investment firm Yorkville Capital, especially if the United States wants to free itself of its dependence on unfriendly countries for crucial energy supplies. Proposed pipeline projects such as the Keystone XL could potentially help expedite that process, proponents argue, but construction of the pipeline has been held up for several years due to environmental concerns. Right now, the lack of infrastructure is leading some oil companies to ship product by rail. While that's solved the short-term transportation issues and given U.S. and Canadian railway companies a boost, a longer term solution is needed, experts argue, and a pipeline is the most efficient way to transport oil and gas. [RELATED: New Offshore Leases in U.S. Could Yield 1B Barrels of Oil] "Rail is part of the long-term solution but it's always more efficient to pipe than it is to rail," Kiley says, adding that a type of asset such as the Keystone XL is crucial because it helps connect burgeoning centers of supply with existing and potentially future demand centers. "It's part of a system of pipelines that allows you and I, in different parts of the country, to get access to the same commodities, the same petrochemical products, and natural gas," Kiley says. According to the U.S. Energy Information Administration, several new pipeline projects already in the works are designed to better regulate the flow of oil through Cushing, Okla., which historically has been the distribution hub for both imported and West Texas oil. In just the past three years, pipeline capacity for getting crude oil to Cushing increased by about 815,000 barrels per day, the EIA reported, mostly thanks to the construction of the southern leg of TransCanada's Keystone pipeline that originates in Alberta, Canada. A slew of other projects to transport crude from Cushing to Gulf Coast refineries are being planned, too. With crude oil output expected to rise 815,000 barrels a day in 2013 to more than 7 million barrels a day, experts say the expanded pipeline capacity will help ease bottlenecks in the system and even help ease some of the pain consumers have been feeling at the gas pump.

## Renewables

### Transition Now

#### Federal and state policies are encouraging increased use of renewable resources

American Council On Renewable Energy (ACORE), California Clean Energy Fund (CalCEF), and Climate Policy Initiative 6/25 (ACORE, a 501(c)(3) non-profit membership organization, is dedicated to building a secure and prosperous America with clean, renewable energy. ACORE provides a common educational platform for a wide range of interests in the renewable energy community, focusing on technology, finance and policy. We convene thought leadership forums and create energy industry partnerships to communicate the economic, security and environmental benefits of renewable energy. Founded in 2004, the California Clean Energy Fund (CalCEF) is a family of non-profit organizations working together to accelerate the movement of clean energy technologies along the continuum from innovation to infrastructure. Using tools from finance, public policy and technological innovation, CalCEF pursues these goals at the local, state and national levels via three affiliated entities: CalCEF Ventures, an evergreen investment fund; CalCEF Innovations, which leads CalCEF’s analysis and solutions development; and CalCEF Catalyst, an industry acceleration platform. Climate Policy Initiative is an analysis and advisory organization that works to improve the most important energy and land use policies in the world. An independent, not-for-profit organization supported in part by a grant from the Open Society Foundations, CPI has offices and programs in Brazil, China, Europe, India, Indonesia, and the United States. “Strategies to Scale-Up U.S. Renewable Energy Investment” http://www.oregonwave.org/wp-content/uploads/Strategies-to-Scale-Up-US-Renewable-Energy-Investment.pdf)

The current balance of federal and state policies is an effective example of how federalism can encourage private sector capitalization and deployment of that capital to diversity the nation’s energy mix with clean and abundant domestic renewable energy resources. This strategy has had a material impact on U.S. energy markets. In 2012, more than 49% of all new power generation came from renewable energy resources, more than any other source including natural gas. In 2012, more than 13,000 MW of wind energy capacity was installed, more than was installed in any one year in the past. The U.S. solar market doubled and also set a domestic record, installing 3,300 MWs in 2012. This impressive growth, even more so at a time following the financial crisis and an overall stagnant economy, yielded a total investment of more than $44 billion in the U.S. renewable energy market, with an associated benefit of adding jobs.

#### **America is rapidly increasing its use of renewable resources**

McGinn 07/04/13 (Admiral McGinn is a widely recognized energy and national security expert. He is regularly asked to participate in public forums about energy and national security and has been published in newspaper articles and opinion pages across the country. He serves as co-chairman of the CNA Military Advisory Board advising policy makers on the nexus of energy and national security, and as an international security senior fellow at the Rocky Mountain Institute. “American renewable energy is powering the American energy transformation” http://thehill.com/blogs/congress-blog/energy-a-environment/309171-american-renewable-energy-is-powering-the-american-energy-transformation)

More so than any other time in history, Americans are focusing their attention on energy issues. From the president’s recent call to action on climate change to the possibility of finally attaining energy independence by the end of the decade, America appears to be entering a new golden age of energy development - great news for our energy security and economy. But for some policymakers on Capitol Hill, there is a need for a much better understanding that renewable energy is a significant and rapidly growing catalyst driving the American energy transformation. Across the country, the renewable energy industry is putting steel in the ground, increasing American energy security, competitiveness, and environmental quality. Simply put, renewables have earned their place in the sun – quite literally in the case of solar, which accounted for 48 percent of all new electricity generation capacity across the U.S. in the first quarter of 2013. Solar’s contribution to America’s energy mix this year highlights a trend of strong growth across the entire clean energy industry. Renewables were the largest source of new U.S. electricity capacity in 2012, providing over 49 percent of all new electrical generation capacity. Of that amount, wind energy made the largest contribution, outpacing even natural gas and adding over double the capacity of new coal last year. For all the hype surrounding America’s oil and gas reserves, it is the renewables industry that is putting up the numbers in the creation of a more diverse and resilient energy portfolio. Furthermore, the International Energy Agency just announced that renewable energy is expected to supply more electricity than nuclear reactors or natural gas by 2016. The EIA also estimates that wind, solar, bioenergy, hydro power, and geothermal may grow 40 percent in the next five years, double the 20 percent rate from 2011. “Renewable power sources are increasingly standing on their own merits versus new fossil-fuel generation,” proclaimed IEA Executive Director Maria van der Hoeven at June’s Renewable Energy Finance Forum-Wall Street in New York. This growth is not an accident. Renewable energy is already cost competitive in many parts of the country and as it continues to scale up, costs will continue to come down. Warren Buffett’s MidAmerican Energy Company will be adding over 1,000 megawatts of new wind power to their Iowa energy portfolio by 2015. This new power will add no net cost to MidAmerican customers and is expected to stabilize long-term electricity rates while actually reducing near-term rates by more than $10 million per year by 2017.

#### The USFG has supported renewable energy in the past and will continue to do so

O’Connor 3/13 (George is an attorney with over 30 years of legal and political experience in national energy and natural resources law and environmental policy. His federal government regulatory and policy experience includes work both at the Federal Energy Regulatory Commission and the United States Senate. He is a graduate of Fordham University in the Bronx, New York, and George Mason University School of Law in Arlington, Virginia. He is a member of the Virginia State Bar and the District of Columbia Bar. “America's Quest for Clean Energy: Is Hydropower Relevant?” www.sciencedirect.com/science/article/pii/S1040619013000274)

The federal government has supported the development of renewable energy for over a century. The original renewable energy source that helped unshackle many Americans from the burdens imposed by life without electricity was hydroelectric power. The early 20th century in America saw enormous growth in industrial manufacturing, much of which was spurred by electricity generated at large water projects developed by the federal government. By mid-century almost every region of the continental United States had some form of hydroelectric power supplying the electricity grid. It was the backbone of an industrial complex that supported one of the greatest military production efforts in world history that ultimately led to the Allies’ victory in World War II. Just a few decades later, our government focused on expanding the source of renewable power by encouraging utility companies to purchase power developed by new renewable technologies like solar and wind power. Indeed, on June 20, 1979, President Carter stood on the roof of the White House with his wife Rosalynn and dedicated a new solar hot water-heater system while announcing a government goal of getting 20 percent of the energy produced in the United States from solar power. He promised to spend $1 billion over the next year to get the initiative going.

#### The US and the world are transitioning towards more renewable sources of energy.

Brown 12 (Lester Russel; United States environmental analyst, founder of the Worldwatch Institute, and founder and president of the Earth Policy Institute, a nonprofit research organization based in Washington D.C.; “The Great Transition, Part I: From Fossil Fuels to Renewable Energy” http://www.earth-policy.org/plan\_b\_updates/2012/update107)

The great energy transition from fossil fuels to renewable sources of energy is under way. As fossil fuel prices rise, as oil insecurity deepens, and as concerns about pollution and climate instability cast a shadow over the future of coal, a new world energy economy is emerging. The old energy economy, fueled by oil, coal, and natural gas, is being replaced with an economy powered by wind, solar, and geothermal energy. The Earth’s renewable energy resources are vast and available to be tapped through visionary initiatives. Our civilization needs to embrace renewable energy on a scale and at a pace we’ve never seen before. We inherited our current fossil fuel based world energy economy from another era. The 19th century was the century of coal, and oil took the lead during the 20th century. Today, global emissions of carbon dioxide (CO2)—the principal climate-altering greenhouse gas—come largely from burning coal, oil, and natural gas. Coal, mainly used for electricity generation, accounts for 44 percent of global fossil-fuel CO2 emissions. Oil, used primarily for transportation, accounts for 36 percent. Natural gas, used for electricity and heating, accounts for the remaining 20 percent. It is time to design a carbon- and pollution-free energy economy for the 21st century. Some trends are already moving in the right direction. The burning of coal, for example, is declining in many countries. In the United States, the number two coal consumer after China, coal use dropped 14 percent from 2007 to 2011 as dozens of coal plants were closed. This trend is expected to continue, due in part to widespread opposition to coal now being organized by the Sierra Club’s Beyond Coal campaign. Oil is used to produce just 5 percent of the world’s electricity generation and is becoming ever more costly. Because oil is used mainly for transport, we can phase it out by electrifying the transport system. Plug-in hybrid and all-electric cars can run largely on clean electricity. Wind-generated electricity to operate cars could cost the equivalent of 80-cent-per gallon gasoline.

#### Obama pledges to move America away from fossil fuels and towards to renewable resources

WWF 6/25/13 (WWF's mission is to stop the degradation of our planet's natural environment, and build a future in which humans live in harmony with nature. “WWF: Obama plan calls for renewable transition”http://wwf.panda.org/?209185/WWF-Obama-plan-calls-for-renewable-transition)

Today, US President Barack Obama delivered a plan of action on climate change in a speech that called for citizens, business and local governments to move away from fossil fuels and invest in a renewable future. Samantha Smith, Leader of WWF’s Global Climate and Energy Initiative, says President Obama’s plan won't reduce US carbon pollution as much as scientists or equity say is needed. “Still, it sends a strong political signal, also globally. It should be a powerful spur to other developed countries that have used US inaction as an excuse for their own failure to act. “The plan’s limits on dirty coal-fired power and getting rid of subsidies for fossil fuel companies will do a lot to move the US away from burning fossil fuels, by far the biggest source of carbon pollution. These steps are needed in many countries, both developed and developing, if we are to reach a cleaner, renewable future.” WWF also welcomes President Obama’s announcement that US public funds will no longer go to pay for dirty coal plants overseas. WWF will continue to push for a large and concrete increase in US finance for renewables abroad, including both community-based energy access and utility-scale plants.” Lou Leonard, WWF-US Vice President for Climate Change, says President Obama rightly sees climate change as requiring a government-wide plan, including action on pollution from the largest source of US emissions -- existing dirty power plants. “Recognizing that the US needs to meet its international commitments and strongly support robust international action is also crucial as the world works to forge a new global climate pact by 2015,” he says. “What we need next is a strategy that identifies our destination and how fast we will move to get there. We have the technology and the business case to meet science-based climate goals by the end of this decade, get off dirty fuels and move to 100% renewable energy today. As President Obama fills in the details of his plan, the best science should serve as his compass if we are to find the way to safer shores,” says Leonard.

### Oil Kills Transition - Investment

#### Empirics from 2007 prove oil investment undermines renewables investment

Blumenauer30 June 2010**.** "Blumenauer Introduces Bill to Close Billions of Dollars in Oil Industry Tax Loopholes." — Climate Solutions. N.p., n.d. Web. 05 July 2013. <http://climatesolutions.org/news/blumenauer-introduces-bill-to-close-billions-of-dollars-in-oil-industry-tax-loopholes>. Elected to the US House of Representatives in 1996, Mr. Blumenauer has created a unique role as Congress’ chief spokesperson for Livable Communities: places where people are safe, healthy and economically secure. From 1996 to 2007, he served on the Transportation and Infrastructure Committee, where he was a strong advocate for federal policies that address transportation alternatives, provide housing choices, support sustainable economies and improve the environment. He was a member of the Foreign Affairs Committee from 2001 to 2007, and vice-chair of the Select Committee on Energy Independence and Global Warming from 2007 to 2010. He is currently a member of the Budget Committee and Ways and Means Committee and the subcommittees on Health and Trade.

For decades, the oil industry has enjoyed billions of dollars in subsidies and tax breaks despite making record-breaking profits. While ordinary Americans pay into the tax system, Big Oil benefits from exemptionsthat will total around $35 billion over the next five years. At a time when the top five oil companies made more than $123 billion in profits in 2007, these unnecessary carve-outs have exacerbated the deficit, undermined our ability to invest in clean, renewable energy, and damaged our environment – with the tragic oil spill in the Gulf of Mexico demonstrating the consequences of our addiction to oil. At time when we are working to recover the economy and curb the deficit, America cannot and should not subsidize the most profitable corporations in the world. President Obama’s FY 2011 Budget proposed ending many of these tax breaks, which could reduce the deficit and fund national priorities from education to clean energy. At the recent G-20 Summit in Pittsburgh, the administration again agreed to eliminate these subsidies, which will save taxpayers an estimated $35 billion over 10 years.

#### Investment in oil is wasteful and further prolongs the transition to renewables

MuiJune 20,2012 Simon Mui. Before I came to NRDC, I worked for the U.S. Environmental Protection Agency in Washington, D.C., **where I analyzed** and authored studies on plug-in electric vehicles and on climate mitigation strategies for the transportation sector. I have also served as a fellow at Harvard’s Kennedy School of Government, as an engineer developing lithium-ion batteries at a start-up company, and as a research consultant. I hold a doctorate in materials engineering from MIT, with a focus on electrochemistry and lithium ion batteries, as well as a master’s in technology policy. “At It Again: Flawed Oil Industry Study Undermines California's Efforts to Provide More Clean Fuel Choices and Cut Our Oil Dependence”, http://switchboard.nrdc.org/blogs/smui/at\_it\_again\_flawed\_oil\_industr.html)

The Oil Industry Needs to Invest More in Our Future The need for alternatives was underscored over the past year when turbulent events in the Middle East, growing demand in Asia, and refinery accidents and shutdowns created large oil and gas price spikes in California. Consumers and businesses ended up spending $70 billion at the pump -- with $40 billion of it shipped out of state to the oil industry at large, which took home record profits. That’s a leak in California’s economy three times the size of the state’s budget deficit. Unfortunately,the oil industry overall has not invested significantly to provide us with cleaner, alternative fuels interest. In a study we conducted, for every dollar they spend to produce more oil, only a fraction of a penny has been devoted to substitute clean fuel technologies. By contrast, the oil industry spent $190 billion the past five years in producing even dirtier tar sands. If just a fraction of this were redirected and redeployed to scale-up advanced renewable fuels, it would be enough to meet and far exceed the LCFS standards. The LCFS requires them to significantly invest in these alternatives, which will grow jobs in California and could make the state a net exporter of cleaner fuels and technologies. AB32 Is Delivering Consumers Savings at the Gas Pump Three AB 32 programs – the low carbon fuel standard, clean car standards, and SB375 (California’s Sustainable Communities Planning Act), together with the other smaller oil saving measures -- will collectively reduce our state’s fuel bills by $50 billion over the next 10 years, translating into household fuel savings averaging $800 to $1,100 by 2022. Without AB 32, much of those billions would be sent to the Middle East and other oil exporting countries, and the remainder on increasing industry revenues. In addition, numerous independent economic studies conclude AB 32 can help save consumers money at the pump. Meanwhile, other California and U.S.-based companies are ready to produce clean fuelsto meet the LCFS. These electricity, renewable biofuels, natural gas, and renewable hydrogen suppliers have the technologies now. However, they need regulatory certainty to ensure investment. For example, oil industry lobbying to remove critical policy drivers like the LCFS and national Renewable Fuels Standard are creating a destabilizing investment climate in an already tough economy for the advanced biofuels industry. It’s a self-fulfilling prophesy – if enough uncertainty is created around these policies, then no investors will invest. If there are no investments, then the standards won’t – by definition - be reached. Instead of trying to scare policymakers about the impacts of AB 32 with one-sided studies, we should all be working toward successful implementation that will result in oil companies investing more to provide us with homegrown, domestic fuels. We can work to upgrade California’s refineries to be more energy efficient and to also become fuel providers of the future by producing renewable-based fuels. Californian consumers and companies can all benefit by cutting our fuel costs, diversifying our supply, creating good jobs, and protecting our health and the environment.

#### America needs to cut back on oil to prioritize renewables; focusing on oil undermines transition

SonyaHetrick 2008 (Sonya officially joined the Wealth Management Group as an Investment Associate in 2012. Prior to this full-time role, Sonya worked for Bailard as a Wealth Management Intern. Her current responsibilities include account administration, serving as a custodian liaison, and providing client service. In 2008, Sonya graduated magna cum laude with a B.S. in Economics from American University, where she received a full merit scholarship. The Greatest Market Failure the World Has Seen; Book published January 1, 2008)

While Americans concerned about global warming are diligently turning off the water while they brush their teeth, 137,000 million gallons per day are being withdrawn for US generation of thermoelectric-power. [1] While shoppers are stressing out over paper or plastic, US industry emits over 2.7 billion pounds of toxic chemicals into the air each day. [2]One reason for this preoccupation with energy reduction based on individual acts is that big business has cunningly co-opted the meaning of environmental sustainability rather than accepting responsibility for its culpability in the problem. Their drive is profit. Recognizing the increasing number of Americans who don’t want to support companies that harm the environment, they flood the airwaves with newly-greened corporate images but avoid making any substantial changes in their business practices. Americans must not allow themselves to be so misled. “Clean coal” is an oxymoron. The harmful impacts of global warming, acid rain, ozone depletion, and chemical toxins on natural ecosystems and human populations have long been acknowledged. Human economic activity is inducing changes in the level of greenhouse gases greater than those associated with the onset and termination of the last ice age. [3] Present-day computational models have basically no way of knowing what kind of massive re-organization of the ocean-atmospheric system could occur, nor the human suffering that could result. Adding in uncertainty and irreversibility, the issue of global climate change becomes more serious, not less. Action to cut back the use of fossil fuels need not await a full cost-benefit analysis. In order to achieve the 50–80% level of greenhouse gas reductions that scientists believe will be necessary to avert environmental catastrophe, large-scale structural changes are necessary. As concluded in 1987 by the World Commission on Environment and Development and affirmed in 1992 at the Rio Earth Summit, sound incentive structures are key. [4] If humankind is to reach a sustainable future, environmentalists cannot merely issue pleas for voluntary emissions reductions. Polluters will not suddenly decide to account for the social and environmental costs of their business. Rather, considerations for ecological sustainability must be integrated into practical policy and decision-making. If humankind is to reach a sustainable future, environmentalists cannot merely issue pleas for voluntary emissions reductions. As a 1992 World Bank study found, current policy incentives, especially within the energy sector, are environmentally destructive, economically inefficient, and trade distorting. [5] Energy is quite heavily subsidized, by $240 billion per year, [6] and over 80% of subsidies flow to oil, coal, and gas. [4, p. 49] The traditional justification for subsidies is to make possible economic growth. But current programs are “ineffective in fueling economic growth or in reducing the vulnerability of the domestic economy to external shocks...[they may even] hamper economic development.” [6, p. 52]As the Organization for Economic Cooperation and Development (OECD) admits [7], the excessive subsidies for agriculture, energy, transportation, and industrial activities disbursed by OECD member governments have encouraged pollution, exploitation of natural resources, and waste generation. All of non-electrified sub-Saharan Africa could be supplied with energy from small-scale solar facilities, for example, for less than 70% of what OECD countries spend subsidizing fossil fuels each year. [8] By means of such perverse subsidies, governments are undermining the health of the earth with public funds. … excessive subsidies for agriculture, energy, transportation, and industrial activities have encouraged pollution, exploitation of natural resources, and waste generation. Nowhere is the need to reform energy policy more critical than in the US. According to the 2005 UN Development Report, the US accounts for a quarter of the world’s greenhouse gas emissions, twice the share produced by the five next-largest industrialized countries combined. [9, Table 22] Most pundits agree that the US will exhaust its oil reserves within the next 20 years, with the rest of the world following shortly thereafter. The impending depletion of domestic oil implies that the US may soon have no choice but to shoulder the fiscal responsibility of leading the worldwide transition to renewable energy sources.To start guiding business practices and human behavior towards more socially optimal ends, the US must immediately eliminate its subsidies to conventional polluting technologies, which received $21 billion during the mid-1990s. [10, p. 70] This could be achieved through structural reforms such as imposing sunset clauses and financial limits on subsidies, introducing a burden of proof, and conducting regular industry evaluations. The removal of fossil fuel subsidies would lower US CO2 emissions to 16% below 1990 levels by 2010, thereby surpassing its Kyoto target. [10, p. 70] As calculated by the OECD, up to 200 million tons of CO2 would be conserved. [7]While this environmental gain is significant, much greater emissions reductions will be needed. For there to be hope of mitigating climate change, the full amount currently spent subsidizing fossil fuels must be shifted to renewable energy sources, which currently supply a mere 7% of energy worldwide. [10, p. 92] One recent analysis indicates the urgency of this task. To stabilize CO2 at 550 ppm, if energy demand grows in the middle of the International Panel on Climate Change’s scenario range, the power sector will have to be de-carbonized by at least 60%, and perhaps as much as 75%, by 2050. [11, p. xiii] This would mean having more renewable energy by 2050 than today’s total world energy consumption. Is this even possible? Unfortunately, most renewable sources suffer from low power densities; meeting current US demand for all energy would require a square of photovoltaic (PV) flat-plate collectors twice the size of New Jersey. [12] Moreover, since renewable sources generate energy only intermittently — when the sun is shining or the wind is blowing — storage systems will have to be developed to reliably deliver electricity. Yet if renewable sources are given sufficient support, these two problems are not unsolvable. Innovative options exist, but they lack funding. Sunlight is more intense and always available in space, so the same amount of solar power could be collected with an array area 10 times smaller than one on the Earth’s surface; the cost of launching material into orbit has so far been prohibitive. [13, p. 104] Similarly, while electrolyzers and hydrogen fuel cells could be used for energy storage, for large-scale use their costs must be brought down to $200/kW and $50/kW, respectively. [12]If fossil fuel subsidies are shifted from conventional to renewable energy sources, will prices converge enough for business and industry to find the switch to less-polluting technologies attractive? Considering the huge market imbalance — in 2004, existing renewable electricity capacity (excluding large hydro) totaled only 160 GW worldwide, compared to total installed capacity of 3,800 GW — this may seem unlikely. [14] The average costs of renewable electricity are high; perverse government subsidies and the externalization of environmental costs keep the prices of electricity produced with coal and nuclear technologies artificially low: about 3 and 5 cents per kWh, respectively. Nevertheless, wind and solar power are the fastest-growing energy sources in the world. [15] Depending on the technology and site, they are already competitive in some applications, and costs for producing commercial heat and grid electricity are falling. According to the International Energy Agency, “under best conditions — optimized system design, site and resource availability — ...[renewable energy] plants can produce electricity at costs ranging from 2–5 cents/kWh.” [14]Costs will be higher in the first decades. However, as UK Prime Minister Tony Blair declared, investment in carbon-free energy sources is a “major down payment in our future.” [16] It took nearly 30 years for the world to produce its first GW of PV capacity; four years later, by the end of 2003, this total had tripled). [10] In fact, the Task Force on Renewable Energy of the G8 industrial countries has determined that successful promotion of renewables over the period to 2030 will be less expensive than taking a business-as-usual approach, and the IEA has declared that the transition to a more sustainable energy system is “inevitable.” With rapid innovation to increase conversion efficiencies and reduce costs, the potential of renewables is significant. In 1991, a wind inventory taken by the US Dept. of Energy showed that Texas, North Dakota, and Kansas have enough viable wind energy resources to satisfy all national electricity demands. [17] Wind presents a dual-use technology in that much of this land could still be used for farming, ranching, and forestry. In 1998, Shell’s UK Director of Corporate Affairs, John Mills, predicted that alternative systems could supply up to 50% of the world’s electricity by 2050. [18] The environmental benefits will be huge; for example, each 1 kW solar PV panel, with an average five hours of sun per day and saving 662 pounds of CO2/kW, conserves 1330 kg of CO2 a year. [12] As the world’s single biggest user of fossil fuels, the US must take the lead in this effort. Power from clean air and sunlight is likely to be the only way of meeting energy demand while cutting CO2 emissions by 50–80%. In order to make this even possible, an unprecedented investment in renewable technologies is necessary. As the world’s single biggest user of fossil fuels, the US must take the lead in this effort. Currently, spiking oil prices, fears over national security, and a growing awareness of the dangers of climate change are fueling clean-energy fever, and US environmentalists must capitalize on this momentum. It will require political courage to break polluters’ addiction to fossil fuel subsidies, but the social, economic, and environmental benefits of carbon-free energy — on both the national and the global level — are too great to excuse inaction. Americans cannot content themselves with individual lifestyle changes like switching to compact fluorescent bulbs, recycling a few more cans and bottles, or buying organic produce when it’s on sale. According to the distinguished economist Sir John Stern, climate change is the “greatest market failure the world has seen.” [11] Therefore, economic incentives and structures must be altered: perverse subsidies corrected and renewable technologies financed. Such policies carry the promise of a sustainable future — one in which businesses can satisfy society’s needs, earn profits, and help prevent global warming all at the same time.

### Oil Kills Transition – Prices

**Sustained high oil prices are key to investment in renewable energy**

Amy **Lee 11**, blogger at the Huffington Post, “Venture Firms Hope High Oil Prices Will Spur Cleantech Interest”, March 10, http://www.huffingtonpost.com/2011/03/10/oil-prices-renewable-energy\_n\_833975.html

It takes a special kind of optimist to see spiking oil prices as an opportunity. But for venture capitalists placing their bets on renewable energy, the two-year high in oil prices is **a chance to** **re-engage the public** with the potential of emerging clean technologies. But increased attention doesn't necessarily mean increased investment -- at least not right now. "The venture investor community has not increased deal flow because of this recent development," said David Cheng, senior research analyst at the Cleantech Group, though he noted the price of oil has gotten "mainstream people" talking about hybrid cars and electric vehicles. If oil spikes haven't spurred an equivalent spike in venture deals, at least part of the reason is the long time frame associated with developing clean technologies. Many projects will take over a decade, and a great deal of capital, before turning out a product ready for the market. "When we're investing in early-stage companies it's not about what oil prices are doing today, this week, or this month," said Ira Ehrenpreis, general partner at Technology Partners, a venture firm with a cleantech focus. "It's about what technologies can leapfrog and become important players in energy -- many will take years to develop and evolve. It's about **the long-term trends** that **we see**." And for venture capitalists, those forecasts have always included rising oil prices. Investors funding renewable energy startups already operate on the assumption that the reality of high oil prices will one day give alternate sources of energy a much more important role to play. "It's an old saying, but the solution to high commodity prices is high commodity prices," said Steve Goldby, partner at venture firm Venrock. But renewable energy isn't just competing against oil. Solar energy, for example, would also have to be cost-competitive with natural gas and coal. Though the prices of natural gas and oil used to move together, discoveries of massive amounts of shale gas in the U.S. have led to lowered prices for gas, even as oil prices rise. Still, for the average driver confronting $4 gallons at the pump, rising oil prices could be a provocation to begin considering the merits of hybrid and electric vehicles. Cost-competitive alternative vehicles could not only lead more consumers to buy electric, but also make the sector more attractive to venture firms. More generally, it emphasizes the immediate, tangible effects of oil dependence.

**Sustained prices ensure development that permanently lowers costs – the risk premium is key to short-term transition**

**IBT 10** [International Business Times, 5-30-10, “Why lower Saudi oil prices kill alternative energy,” http://www.ibtimes.com/articles/154524/20110530/saudi-arabia-oil.htm]

On the other hand, if oil skyrockets to $200 per barrel, it would make **absolutely sense** to develop oil sands, oil shale, and electric cars. Experts generally put the threshold at which alternative energy becomes viable at **a long-term sustained price of $80 per barrel**. A recent Federal Reserve research, for example, puts the figure for oil sands at $70 per barrel in 2005 terms, which translates to $77.5 in 2010. According to Al-Waleed, Saudi Arabia probably estimates the threshold to be $80 per barrel. The cost of many alternative energy sources is front-loaded. For example, once a solar farm is constructed and the electric grid is built, the cost of harvesting additional electricity becomes extremely cheap. The danger for oil producers like Saudi Arabia is that once a sustained period of high oil prices induces the Western private sector to invest the upfront costs of setting up alternative sources, **the price of energy will be lowered permanently.** The optimal strategy for Saudi Arabia, therefore, is to avoid a sustained period of high oil prices. For Western countries, the **optimal strategy** to bite the bullet, pay the upfront cost, and save money in the long-run with cheap alternative energy sources.

#### High oil prices would prolong America’s shift to renewables

Kyle 2008 December 8, 2008 Steven Kyle is professor of applied economics and management at Cornell University, where he specializes in energy policy. "For Alternative Energy's Sake--Keep Oil Prices High: Scientific American." For Alternative Energy's Sake--Keep Oil Prices High: Scientific American. N.p., n.d. Web. 09 July 2013. <http://www.scientificamerican.com/article.cfm?id=keep-oil-prices-high>.

As oil and related energy prices soared to record highs over the past two years, interest in alternative fuels soared, too. Hybrid cars have appeared seemingly overnight, and proposals for solar, wind and other renewable technologies are being made everywhere. We need to remember, however, that all this action has one cause—high oil prices—and progress could grind to a halt if those prices fall again.It might seem ridiculous to worry about such a thing; don’t we all want to spend less on oil? And isn’t hoping for that just whistling in the dark? Not necessarily. At present, it is virtually axiomatic in the popular press that growth in demand from the U.S., China, India and elsewhere will keep oil prices high forevermore. But this common wisdom ignores the possibility of recession, or even depression, reducing demand growth to near zero, just as new drilling (mostly overseas) increases supply.Recession is already upon the U.S., and China’s economy is slowing rapidly. As Wall Street collapsed in October, oil prices dropped to around $70 a barrel. Saudi Arabia’s stated goal of maintaining a price floor of $80 a barrel or higher suddenly seemed optimistic. So what is the problem? In the short run, nothing. But sustained development of new energy sources always rests on the condition of the old ones. Coal did not arise as Europe’s main energy source until Europeans had cut down virtually all their forests for fuel, and the later switch to oil did not occur until the scarcity of coal drove its price high. In the 1970s Americans responded to high oil prices with alternative energy projects and more fuel-efficient cars. But when prices dropped in the 1980s, we threw caution to the wind—along with the energy projects. We purchased ever larger cars and SUVs and moved to ever more distant suburbs. Sure enough, now that oil prices have spiked again, we are looking at the same alternatives we had relegated to niche markets then. Today renewable technologies such as wind and solar are close to being competitive with fossil fuels. But we can say good-bye to that prospect if oil prices decline to $60 to $70 a barrel, which could easily happen in a recession, as we witnessed in October. Two years of lower prices can turn hybrid cars into a bad financial proposition for consumers, and green technology start-up companies could go bankrupt as demand for their goods dries up. Even a temporary decrease in petroleum prices would undermine the long-term development of the alternatives we all know we need. Happily, there is a solution. If investors could rely on a certain lower limit to oil prices, they would have a fixed goal to work toward for making alternatives cost-effective. Knowing the goal removes a large element of risk for entrepreneurs and their financiers, providing a huge incentive to continue development. A lower limit is easy to accomplish: the federal government has to impose a variable levy on oil to guarantee a floor price. Revenues from that tax could help fund research into alternative energy and offset adverse consequences for lower-­income people, who would be hardest hit by the sustained high expense of oil. Higher taxes? Unthinkable! That sentiment certainly rules in the current political climate. But one thing is certain: the federal government is already running a deficit on the order of $400 billion for this year, and many more billions are promised to save Wall Street; that money will have to come from somewhere. Why not a tax that benefits both the environment and the economy?

### Solve Warming

#### Renewables are critical to transition away from fossil fuels – only way to solve climate change

Elaine K. Hart, Student Member IEEE, Eric D. Stoutenburg, Student Member IEEE, and Mark Z. Jacobson February 2012 http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5876295&tag=1

The potential of renewable energy sources to supply a large fraction of electric power demand has been a growing area of research over the last decade, fueled by political climates that increasingly value energy independence, sustainability, and low-carbon and low-air pollution technologies. The necessity of reducing greenhouse gas emissions via the decarbonization of the electricity sector has been demonstrated by the International Panel on Climate Change (IPCC) [1] and has been discussed from an economic perspective in the Stern Report [2]. In this context, resource assessments have noted the potential of renewable technologies like wind and solar power to make significant contributions to decarbonization. McKinsey & Company reported in a study of the carbon abatement potential for several sectors in the United States that wind and solar power could avoid 170 megatons of CO2 per year by 2030 [3]. Pacala and Socolow notably included 2000 GW each of wind turbines and photovoltaic systems as potential strategies toward stabilizing global greenhouse gas emissions [4]. And in 2001, Jacobson and Masters suggested that the United States could meet its proposed Kyoto Protocol targets by replacing 60% of coal generation with 321–354 GW of wind turbines [5]. Despite the promise of wind and solar power to reduce carbon dioxide emissions, the ability of these intermittent renewable resources to contribute to supplying a fluctuating electricity demand remains an open area of research.

#### Only renewable transition can avoid warming

Rynn ’12 – Ph.D. in political science and is a Visiting Scholar at the CUNY Institute for Urban Systems (Jon, “The Essentials for the Necessary Transition to a Renewable Energy Economy”, Jan 15, http://www.alternet.org/story/153704/the\_essentials\_for\_the\_necessary\_transition\_to\_a\_renewable\_energy\_economy?page=0%2C1)

Fossil fuels are going to disappear, whether we like it or not. Petroleum, natural gas, and coal are becoming scarcer, harder to extract and a greater danger to the global climate. If we proceed with business-as-usual, energy companies will take advantage of increasing scarcity to dominate the world economy by vacuuming up more money from the 99%. They will be able to ally with military and financial institutions to construct an energy-military-financial complex that could eventually reduce most of the rest of us to a form of debt peonage. On the other hand, if we could possibly elect a government that does what governments do best – build infrastructure – we can avoid a world of global warming and economic collapse by building enough wind farms, solar panels, and geothermal systems to power our economy and ignite a sustainable, broad-based period of economic growth. Of course, this will require a sea-change in the direction of the political system, along the lines of the Occupy movement, but there is too much at stake to throw up our hands in despair. The unfolding energy drama presents progressives with several dilemmas. Some are suspicious that oil scarcity can be used as a ruse by the oil companies and speculators to spike prices. Roger Altman recently argued that a larger supply of fossil fuels will lead to less international tension. More generally, progressives sometimes fear that advocating for less oil use will be seen by the public as an attack on the American Dream of a car in every garage and a single family home for every family. But in addition to problems of scarcity and extraction, fossil fuels are bringing us towards extremely dangerous climate change . We need to have some answers or else the Right will simply keep up with the chant of “Drill baby drill.” It's time to counter with, “Build, build, build!" Dirty fuels Create an Unsustainable economy The question of the future of the supply of fossil fuels is not an easy one to answer. Oil producing nations, for instance, are not at all transparent about their supplies. Technologies constantly change, and so do environmental hazards. However, if we look at the current state of fossil fuel industries, it should be clear that we are in trouble. 1) Natural gas . Natural gas production is being kept alive by the development of hyrdrofracturing technology, or “ fracking." As AlterNet has reported, an official with New York State stated that fracking will contaminate water supplies. His is only the most recent statement of a widespread concern about the dangers of this new practice. France has temporarily banned fracking, and New York State is considering how to proceed, but one would hope that the possibility of making New York City uninhabitable because of contaminated water would focus minds considerably. Beyond environmental concerns, the corporate hype surrounding fracking as a “game changer” is false. Even the Energy Information Administration, generally a cheerleader for the industry, predicts that with fracking American natural gas production will increase by only 31 per cent by 2035. That increase probably won’t even cover growth of the economy, and even so there is talk of exporting natural gas, which will decrease the amount available for domestic use even further. The problem is one that is endemic to the current fossil fuel industry – the conventional methods of extraction are leading to precipitous drops in production as fields are sucked dry, so extreme extraction is the only route left. 2) Oil. The environmental situation is at least as bad in the case of petroleum production, as we saw in the Gulf of Mexico in 2010. Despite industry trumpeting of new technological breakthroughs, the underlying fact is this: oil companies would not be oil-fracking, drilling multi-mile pipes underwater, exploring the Arctic and cooking tar sands if they could do what they did for the first 100 years of the oil age -- drill into pressurized deposits of oil that are conveniently situated below solid, dry, accessible land. The energy gained compared to the energy needed to discover oil has collapsed from 1200 to 5 in the last 100 years. By contrast, wind energy now returns 25 times the energy needed to provide it. Despite all of the new oil extraction techniques, global production of petroleum has stagnated since about 2005. This plateau in production is referred to as “peak oil” by activists who are concerned about how a civilization that requires oil for its transportation needs will survive if the supply should start to shrink precipitously. As scarcity leads to higher gasoline prices, economies stop growing , which leads to less demand for gasoline and then, temporarily, lower prices, until demand lifts the price again, and the cycle repeats itself. Meanwhile, in a desperate attempt to stave off the inevitable, societies encourage dirtier and dirtier methods of extraction. Nigeria, a major oil exporter, illustrates this irony. The problem of peak oil is exacerbated by the decrease in exportable production, because big exporters like Nigeria and Saudi Arabia keep using more oil for their own use. When the Nigerian government tried to eliminate gasoline subsidies, riots ensued , a process that has repeated itself throughout the oil-producing nations, thus decreasing the amount of oil available for oil importers. This rioting occurred at the same time that Nigeria’s oil rich delta experienced a terrible oil spill , an area that endures an Exxon-Valdez-sized spill every year. The Canadian tar sands may be the worst of all fossil fuel disasters , not only because thousands of miles of forest and large deposits of water are destroyed, but because the extra carbon emitted from these formations may mean “ game over ” for the climate, to use eminent climatologist James Hansen’s phrase. The reason Hansen is so worried about the tar sands is because his scenario for avoiding the worst of global warming is to stop using coal, but only if oil production peaks and declines , as peak oil activists predict. If more, dirtier oil flows, then you could shut down all the coal plants and the biosphere would still be in big trouble. 3) Coal. Coal use, at least in the U.S., is indeed declining , although not fast enough – and it is still increasing rapidly in China. But even coal is experiencing supply problems, as China has to import 40 percent of its supplies. The data on coal is even less reliable than the data for petroleum, but some experts have predicted a peak in production as early as 2020. Meanwhile, coal, like oil and increasingly natural gas, continues to wreak death and destruction on its environment. 4) Nukes and biofuels . Uranium is not a fossil fuel, but it is a fuel, as are biofuels, which also have very negative consequences for the environment. Fukushima may have begun to sound a death knell of the nuclear power industry. Even the French nuclear industry, which generates 80% of France’s electricity, has had to lay off employees because contracts to build nuclear power plants have been cancelled. It is becoming clear that biofuels usually cause more damage than benefits, by replacing food production, encouraging deforestation, and increasing pollution. The challenge for humanity is to stop using fuels and to only use renewable sources of energy from the sun, wind, and earth. Transitioning to a renewable energy society For progressives, the fossil fuel crisis provides a great opportunity for equitable, sustainable economic growth. Since energy impacts all sections of society, all parts of the economy must become more just in order to solve the problem. Nowhere is this more evident than in the case of petroleum. While it would be much easier if Sammy and Susie Suburban could wake up in the future and drive their electric cars in just the same way they drive their oil-powered ones, this scenario seems very unlikely . The best way to reduce and eliminate the use of petroleum is to increase the density of town, suburban, and city centers , so that people can choose to walk, bike, or take electric trains such as subways and light rail, and so that slow, low-range actually-existing electric vehicles can cover the shorter distances needed. To make dense city centers attractive, however, a good educational system is required. As the current candidate for Senate in Massachussets, Elizabeth Warren, has argued, much of the expansion of the suburbs and the increased expenditure of family income has occurred in order to live in a good school district. Thus, because of the interconnected nature of the modern economy, it might turn out that the single most important way to solve the energy crisis is to improve urban schools! The technology now exists to supply all the electricity we need by constructing wind farms, solar panels, and energy-efficient buildings. If progressives want to argue for the positive benefits of government, then they can advocate for a multi-trillion dollar program of government-led new energy infrastructure, which would employ tens of millions of people and rebuild the key to our economic prosperity, our manufacturing base. It is exactly because the energy, military, and financial elites will benefit from fossil fuel scarcity that progressives need to tackle the problem head on. In rebuilding the infrastructure, the economic fortunes of the 99 percent can be revived as well.

**Renewables are increasingly effective – new tech is in the pipeline and can meet energy targets**

James **Kanter**, 6/3/2011, “A 'Big Thumbs Up' for Renewable Energy”, http://www.nytimes.com/2011/06/03/business/energy-environment/03iht-RBOG-Kanter03.html?\_r=1&pagewanted=print)

BRUSSELS — Governments around the world have pledged emissions cuts aimed at keeping global warming below levels that could set off runaway climate change. So what proportion of the low-carbon energy needed to meet those goals will come from sources like the wind, sun and waves? Most renewable sources are abundant, practically inexhaustible and far more climate friendly than fossil fuels. Some companies making equipment to harness these energies are growing rapidly. Last month, experts advising the United Nations said renewable sources could deliver nearly 80 percent of world’s total energy demand by the middle of the century. That report, by the Intergovernmental Panel on Climate Change — the most authoritative body of experts, scientists and engineers specialized in climate change — was a welcome signal for an industry that has faltered in previous decades after government subsidies dried up and **lower-cost fossil fuels** made their technologies uncompetitive. The report “is a big thumbs up for an industry that’s making huge advances in lowering costs and improving efficiency,” said Maja Wessels, global head of government affairs for First Solar, one of the largest makers of solar panels. “The experts have said that reaching high renewables targets will become **very achievable**.” She said that the report should serve as basis for governments and lenders like the World Bank to plan investment in energy systems and infrastructure. Governments staking out a low-carbon future also welcomed the findings. Charles Hendry, the British minister for energy and climate change, said the report “makes it completely clear that this is a massively growing area” that could deliver “a turnaround moment for many parts of the economy.” Even so, some financiers and environmental groups said the report **underplayed** the potential for renewable energy. The panel “wasn’t aggressive enough and the data were two years old,” said Gerard Reid, an analyst at Jefferies, an investment bank. “For solar panels, and offshore wind and concentrating solar power, we can get the costs down **even quicker**.” WWF, an environmental group, emphasized that it had developed plans for generating **100 percent renewable energy** by 2050. Ottmar Edenhofer, co-chairman of the climate panel that wrote the report, said the findings were realistic. “Under no circumstances can we afford to omit or neglect renewables,” Mr. Edenhofer said by telephone. “But we must remember that there is more than one way to achieve a low greenhouse gas economy.” He was referring to alternatives to renewable sources like nuclear power and technologies **under development** to limit the damage of fossil fuel use by **capturing** and **storing** carbon dioxide before it reaches the atmosphere.

**Prefer our evidence**

James **Kanter**, 6/3/2011, “A 'Big Thumbs Up' for Renewable Energy”, http://www.nytimes.com/2011/06/03/business/energy-environment/03iht-RBOG-Kanter03.html?\_r=1&pagewanted=print)

A summary of the climate panel’s report was published on May 9, after **194 governments** agreed to the text. The report was based on a comparison of 164 evaluations of the technology and provided the **most comprehensive analysis to date** of trends and perspectives for renewable energy. The panel was expected to publish a full report of more than 900 pages by mid-June, once scientists have completed final checks.

**Recent study agrees alternatives solve – more support is key**

Michale Casey, 5/14/11, “Renewable energy key in climate fight”, http://www.statesmanjournal.com/article/20110515/GREEN/105150314/Renewable-energy-key-climate-fight?odyssey=mod|newswell|text|News|p

ABU DHABI, United Arab Emirates — Renewable sources such as solar and wind could supply up to 80 percent of the world's energy needs by 2050 and play a significant role in fighting global warming, a top climate panel concluded Monday. However, the U.N. Intergovernmental Panel on Climate Change said that to achieve that level, governments would have to spend **significantly more money** and introduce policies that integrate renewables into existing power grids and promote their benefits in terms of reducing air pollution and improving public health. Authors said the report concluded that the use of renewables is on the rise; their prices are declining; and that with the right policies, they will be an important tool both in tackling climate change and helping poor countries use the likes of solar or wind to develop their economies in a sustainable fashion. "The report shows that it is not the availability of the resource but the public policies that will either expand or constrain renewable energy development over the coming decades," said Ramon Pichs, who co-chaired the group tasked with producing the report. "Developing countries have an important stake in this future — this is where 1.4 billion people without access to electricity live yet also where some of the best conditions exist for renewable energy deployment."

**Renewables transition solves warming**

Arent et al 10[Douglas, Alison Wise, Rachel Gelman; Arent and Gelman, National Renewable Energy Laboratory; Wise, Ecotech Institute in Denver, CO;l, 11-11-10, “The status and prospects of renewable energy for combating global warming,” http://www.sciencedirect.com/science/article/pii/S0140988310001908]

Reducing anthropogenic greenhouse gas (GHG) emissions in material quantities, globally, is a critical element in **limiting the impacts of global warming**. GHG emissions associated with energy extraction and use are a major component of any strategy addressing climate change mitigation. Non-emitting options for electrical power and liquid transportation fuels are increasingly considered key components of an energy system with lower overall environmental impacts. Renewable energy technologies (RETs) as well as biofuels technologies have been accelerating rapidly during the past decades, both in technology performance and costcompetitiveness — and they are increasingly gaining market share. These technology options offer many positive attributes, but also have unique cost/benefit trade-offs, such as land-use competition for bioresources and variability for wind and solar electric generation technologies. This paper presents a brief summary of status, recent progress, some technological highlights for RETs and biofuels, and an analysis of critical issues that must be addressed for RETs to meet a greater share of the global energy requirements and lower GHG emissions.

**Increasing renewables avoids catastrophic warming**

Renewable Energy World, ‘7, “ASES Report: Renewable Energy Can Curb Global Warming by 2030”, Feb 7, <http://www.renewableenergyworld.com/rea/news/article/2007/02/ases-report-renewable-energy-can-curb-global-warming-by-2030-47351>)

American Solar Energy Society (ASES) unveiled its 200-page landmark report, "Tackling Climate Change in the U.S.: Potential Carbon Emissions Reductions from Energy Efficiency and Renewable Energy by 2030." The report illustrates how concentrating solar power (CSP), photovoltaics (PV), wind power, biomass, biofuels, and geothermal power, combined with energy efficiency measures, can displace approximately 1.2 billion tons of carbon emissions annually by the year 2030 -- the magnitude of reduction that scientists believe is necessary to prevent **the most dangerous consequences of climate change**. The results of these studies show that renewable energy has the potential to provide approximately 40% of the U.S. electric energy need projected for 2030 by the Energy Information Administration (EIA). After we reduce the EIA electricity projection by taking advantage of energy efficiency measures, renewables could provide about 50% of the remaining 2030 U.S. electric need. In the Executive Summary, editor Charles F. Kutscher, Ph.D, P.E. wrote: For SOLAR 2006, its 35th Annual National Solar Energy Conference last July, the American Solar Energy Society (ASES) chose to address global warming, the most pressing challenge of our time. Under the theme "Renewable Energy: Key to Climate Recovery," climate experts James Hansen of the National Aeronautics and Space Administration (NASA), Warren Washington of the National Center for Atmospheric Research (NCAR), Robert Socolow of Princeton University, and Marty Hoffert of New York University (NYU) described the magnitude of the global warming crisis and what is needed to address it. A key feature of the conference was a special track of nine invited presentations by experts in energy efficiency and renewable energy that detailed the potential for these technologies -- in an aggressive but achievable climate-driven scenario -- to address the needed U.S. carbon emissions reductions by the years 2015 and 2030. These presentations covered energy efficiency in buildings, industry, and transportation, as well as the following renewable technologies: concentrating solar power, photovoltaics, wind, biomass, biofuels, and geothermal. Since the conference, these studies were subjected to additional review and were revised for publication in this special ASES report. According to Hansen, **NASA's top climate scientist**, we need to limit the additional average world temperature rise due to greenhouse gases to 1 degree C above the year-2000 level. If we fail, we risk entering an unprecedented warming era that would have **disastrous consequences**, including rising sea levels and large-scale extinction of species. Limiting temperature rise means limiting the carbon dioxide (CO2) level in the atmosphere to 450 to 500 parts per million (ppm).

### A2 Intermittent/Power Generation

#### Overbuilding generating capacity solves

Clarke 3-29-2013 (Chris, KCET and an environmental journalist, “Another study suggests power storage not all that”, http://www.kcet.org/news/rewire/the-grid/another-study-suggests-power-storage-not-all-that.html)

We reported earlier this week that a German study was saying grid operators don't need power storage to seriously increase the share of renewable energy powering the grid. Now, a similar study conducted a bit closer to home suggests that we can avoid much of the the need for power storage by just overbuilding our renewable generating capacity, and that study's authors have good news for California. Related What is Grid Storage? Explained: Understanding Wind Power According to a study of the PJM Interconnection grid in the northeastern United States published in the Journal of Power Sources, intermittent renewable energy sources such as solar and wind could conceivably provide between 90 and 99 percent of the energy required by that grid for a four-year period, with only enough storage to provide a maximum of three days of power consumption

#### Intermittency risks are a joke – they’re normal and no worse with renewables

Engelfried 10 (Nick, staff writer for the Climate Change and Energy & Emissions categories, with a background working on climate and energy issues both on the ground and online, freelance writer on climate and energy issues, Sept 1, http://www.justmeans.com/Dispelling-Myths-About-Renewable-Energy-Intermittency/29246.html)

Dispelling the Myths About Renewable Energy Intermittency If you've done much work on energy and emissions issues, chances are you've run into questions about the intermittency of renewable energy. They come up all the time—both in interpersonal interactions, and even more in online forums. After you've sung the praises of renewable energy and made your point about how much potential there is to develop renewable power, someone asks a question that goes something like this: "What are we going to do when the wind's not blowing and the sun isn't out? Won't all the lights go off?" This is one of the most common and pernicious myths in the world of renewable energy and low-emissions technology, and the act of asking the question displays a certain naïveté about how the electricity grid works. The truth is energy grids are incredibly complex systems that usually draw from several different power sources, and normally experience a wide amount of variability anyway in terms of both demand and supply. Energy demand peaks around the middle of the day and falls to low levels at night. In places where hydropower is used to generate electricity, the ups and downs of rivers must be taken into account. And even the most reliable power plants must sometimes be taken off-grid for repairs or routine maintenance. Keeping the correct amount of energy flowing through power lines twenty-four hours a day is a complicated business. Fortunately, power companies are well equipped to handle it. The fact that energy demand varies from hour to hour and day to day means utilities have a certain amount of flexibility built into the grid already. Retiring fossil fuel plants and replacing them with more intermittently powered wind turbines and solar panels does provide a bit of an extra challenge, but the idea that the lights will suddenly go out when the wind stops blowing is vastly over-simplistic. Energy grids are not built to work that way. Even if you assume renewable intermittency will cause problems the current grid isn't built to address, technologies that can store wind or solar power for later use are becoming more and more feasible. Just last week the state legislature of California passed a bill that requires utilities to invest in infrastructure for storing renewable energy. Lawmakers hope this will help California make the transition to a grid that no longer relies on large power plants, with their copious carbon emissions, to function. California utility PG&E plans to experiment with storage methods including use of wind power to pump water into an uphill reservoir during peak wind conditions, so water can later be released to power another turbine when the wind lags. Also promising is the idea of using electric cars to store energy. Another myth born on the waves of the Internet is that growing demand for electric cars will strain the grid and make it more difficult to replace fossil fuel plants. In fact the reverse is the case: electric cars can help solve the challenge of intermittency. Most cars will do the bulk of their charging at night, when energy use is at its lowest and the added demand is easy to meet. However there will always be a certain number of cars parked during daytime—and with the right technology, they can feed some of their stored energy back into the grid during hours when demand peaks. Electric cars can essentially serve as ready-made energy storage units, and their widespread adoption will make renewables easier to integrate into the grid. So next time you hear someone make the claim that renewable intermittency is an insurmountable problem, don't be fooled. Finding the best way to integrate wind and solar power into the grid does present some challenges, and will involve a certain amount of trial and error. But energy entrepreneurs are fully capable of taking on a challenge. That's what human beings are good at.

#### Renewables solve – they ignore multiple forms of tech

Diesendorf 2011 (Mark, Deputy director, Institute of Environemtal Studies at University of New South Wales, \*\*\*Mark Diesendorf does not work for, consult to, own shares in or receive funding from any company or organization that would benefit from this article, and has no relevant affiliations\*\*\*, “Renewable energy can provide baseload power – here’s how”, <https://theconversation.edu.au/renewable-energy-can-provide-baseload-power-heres-how-2221>)

We do not currently use our energy very efficiently. For example, nighttime energy demand is much lower than during the day, and yet we waste a great deal of energy from coal and nuclear power plants, which cannot be powered up quickly. Some are kept running through the night heating water. These plants can be replaced with solar hot water and renewable electricity.Baseload demand can be further reduced by increasing the energy efficiency of homes and other buildings. Renewable Baseload Sources Some renewable energy sources are just as reliable for baseload energy as fossil fuels.For example, bio-electricity generated from burning the residues of crops and plantation forests, concentrated solar thermal power with low-cost thermalstorage (such as in molten salt), and hot-rock geothermal power.In fact, bio-electricity from organic residues already contributes to both baseload and peak-load power inparts of Europe and the USA, and is poised for rapid growth. Concentrated solar thermal technology is advancing rapidly, and a 19.9-megawatt solar thermal plant opened in Spain in 2011 (Gemasolar, which stores energy in molten salt for up to 15 hours.

#### Scale overcomes intermittency problems – most recent study proves

Massey 12/12/12 (Nathanael, “Solution to Renewable Energy's Intermittency Problem: More Renewable Energy”, http://www.scientificamerican.com/article.cfm?id=solution-to-renewable-energy-more-renewable-energy)

By 2030, scaled-up green power could meet the demands of a large grid 99.9 percent of the time, according to new research from the University of Delaware. A mix of offshore and onshore wind, along with contributions from solar power, could provide reliable power flow during all but a handful of days in the hypothetical four-year period under study. Moreover, researchers found that scaling up renewable generation capacity to seemingly excessive levels -- more than three times the needed load, in some instances -- proved more cost-effective than scaling up storage capacity, due to the high systems costs associated with storage technology. "That's a lot of overbuilding," said Willett Kempton, a professor in the School of Marine Science and Policy at the University of Delaware and a co-author of the study. Much of that excess capacity would be underused during all but a few days a year, he said. At the same time, thermal power plants face a similar problem today through inefficiency, he added. "If you think about it, power plants burn three times the amount of fuel energy needed to produce their energy output," he said. "You burn three units of coal to get one unit of electricity." Overgeneration would be cost effective even if all excess energy were simply dumped, according to the study. If that excess energy were harnessed -- to offset the costs of heating fuels, for example -- costs could be lowered even further. Diversity of supply Reliability has long been the Achilles' heel of renewable energy, which depends on intermittent weather conditions like wind and sun to generate power. However, by extending enough wind turbines and solar panels over a wide enough area, it is possible to achieve approximate reliability by shifting power from active to passive regions.

**No intermittency problems**

**Makhijani ’11** – president of the Institute for Energy and Environmental Research (IEER) and the author of Carbon-Free and Nuclear-Free: A Roadmap for U.S. Energy Policy (Arjun, “Why nuclear energy is not the answer”, September 8, http://www.thebulletin.org/web-edition/roundtables/nuclear-energy-different-other-energy-sources#rt8801)

4. Consistency. Solar and wind power are intermittent. But the wind often blows when the sun doesn't shine. Existing hydropower and natural gas plants can fill in the gaps. Denmark manages intermittency by relying on Norwegian hydropower and has 20 percent wind energy. Today, compressed-air energy storage is economical, and sodium sulfur batteries are perhaps a few years from being commercial. Smart grids and appliances can communicate to alleviate intermittency. For instance, the defrost cycle in one's freezer could, for the most part, be automatically deferred to wind or solar energy surplus periods. Likewise, icemakers could store coldness to provide air-conditioning during peak hot days. The United States is running on an insecure, vulnerable, 100-year-old model for the grid -- the equivalent of a punch-card-mainframe computer system in the Internet age. It's a complete failure of imagination to say wind and solar intermittency necessitates nuclear power.

**Renewables overcome variability and intermittency issues**

**Sovacool & Cooper ‘8** (Dr. Benjamin K. Sovacool is a Research Fellow in the Energy Governance Program at the Centre on Asia and Globalization, part of the Lee Kuan Yew School of Public Policy at the National University of Singapore. He is also an Adjunct Assistant Professor at the Virginia Polytechnic Institute & State University. He has worked in advisory and research capacities at the U.S. National Science Foundation's Electric Power Networks Efficiency and Security Program, Virginia Tech Consortium on Energy Restructuring, Virginia Center for Coal and Energy Research, New York State Energy Research and Development Authority, Oak Ridge National Laboratory, and U.S. Department of Energy's Climate Change Technology Program, Mr. Christopher Cooper is Principal Partner for Oomph Consulting, LLC, and the former Executive Director of the Network for New Energy Choices (NNEC), a New York-based nonprofit interest group devoted to analyzing utility policy and making recommendations for increasing efficiency and expanding the use of renewable resources, “Symposium Issue 1: Emission Not Accomplished: The Future of Carbon Emissions in a Changing World: Symposium Article: Nuclear Nonsense: Why Nuclear Power is No Answer to Climate Change and the World's Post-Kyoto Energy Challenges”, 33 Wm. & Mary Envtl. L. & Pol'y Rev. 1, Fall 2008, lexis)

Previously intermittent sources such as wind and solar also are used to displace nuclear resources. n589 No less than nine recent studies have concluded that the variability and intermittency of wind and solar resources becomes easier to manage the more they are deployed and interconnected, and not the other way around, as some utilities suggest. n590 This is because wind and solar plants help grid operators handle major outages and contingencies elsewhere in the system, since they generate power in smaller increments that are less damaging than unexpected outages from large plants. n591 Researchers at the Georgia Institute of Technology and the Virginia Polytechnic Institute & State University even found that when coupled with a rigorous energy efficiency and demand management program, solar panels could completely displace the electricity currently coming from the two GW Indian Point nuclear facility in New York. n592 Energy storage technologies allow wind and solar farms to operate as baseload plants, even when interconnecting the two technologies is infeasible. Wind turbines combined with compressed air energy storage technologies allow the capacity factor to rise above 70%, making them "functionally equivalent to a conventional baseload plant," according to Paul Denholm of the National Renewable Energy Laboratory ("NREL"). n593 Combining pumped hydro storage with wind and solar can further offset baseload generation.

### A2 Economics

#### Renewables are cheap and affordable – continued growth is key

Robbins 12 (Roni, “How affordable is alternative energy?”, July 27, http://www.mnn.com/earth-matters/energy/stories/how-affordable-is-alternative-energy)

Alternative energy sources that are cost-competitive with fossil fuels may be closer to fruition than most people realize. Recent renewable energy research has shown that solar, hydropower, wind and other alternative sources are closing in on the cost of traditional electricity providers. Solar Crystalline silicon PV solar panels have fallen by more than 60 percent in the last two years to as little as $1 a watt, which is competitive with residential electricity, according to a report released last month by the International Renewable Energy Agency (IRENA). Continued capacity growth in solar energy, along with other renewables, is expected to contribute to further cost reductions, the agency reported. Hydropower The most economical alternative energy source for generating electricity could be hydropower, the study showed. The levelized cost of electricity from a large hydropower plant, which considers costs distributed over the project lifetime, typically ranges from 0.02 to 0.19 cents per kilowatt hour, IRENA reported. Wind Wind turbines prices also have started to fall, and the cost of electricity from wind energy sites in North America, for example, range from 0.04-0.05 cents/kWh. This is competitive or cheaper than gas-fired generation, according to the report. Further alternative energy options that can cost less than electricity from the grid include using agricultural and forestry wastes, or biomass, as feedstock to provide power and heat. The most competitive projects produce electricity for 0.06/kWh. Natural gas Cheap natural gas also is gaining attention as a competitive alternative energy source in the United States. The price of natural gas is at a record low in the U.S. because of increased drilling of the country’s vast shale gas formations. The U.S. Energy Information Administration (EIA) reported earlier this month that the natural gas spot price, which averaged $4 per million British thermal units (MMBtu) in 2011, is expected to average $2.58 per MMBtu this year. Crude oil prices, though, have also been dropping over the past month. EIA has lowered the average regular gasoline retail price forecasts for the third quarter of 2012 to $3.39 per gallon. Regular gasoline retail prices, which averaged $3.53 per gallon in 2011, are expected to average $3.49 in 2012 and $3.28 per gallon in 2013, EIA stated in its Short-Term Energy Outlook release. Affordable alternative energy sources are more readily available, more abundant and generally less damaging to the environment, but skeptics say renewables might not be as efficient as fossil fuels, such as coal and gas. Still, growth in alternative energy continues at an impressive rate considering it has experienced so much competition, consolidation and government cuts. Renewable sources supplied 16.7 percent of global final energy consumption, according to a 2012 global status report last month from the Renewable Energy Policy Network for the 21st Century (REN21). And investment in renewables increased 17 percent last year despite a widening debt crisis in Europe and rapidly falling prices for renewable power equipment, the report stated. It all points to the increasing influence of alternative energy in the electric power marketplace.

#### Capacity trends prove

Molnar 1/7 (Michael, MBA University of Chicago, MSc London School of Economics, BS Rutgers University, “Debating 4 Dirty Myths on Clean Energy”, 2013, http://www.renewableenergyworld.com/rea/news/article/2013/01/debating-4-dirty-myths-on-clean-energy?page=all)

Debate 4: Can Alternative Forms of Energy Make a Difference? Myth: Some of the new technologies, such as solar and wind, will never make a dent in our energy mix Reality: It will take time, yes, but the signs are already clear they are having an impact First, you have to ask yourself if change happens in the energy markets. The answer is yes. The United States has undergone several key transformations of our energy mix. First our energy mix was dominated by wood, then coal, then oil, and now natural gas is gaining share. Given the size of the energy markets, these transitions can take decades. Wood went from about 90% share in 1850 to less than 50% by 1885 and then continued declining. Coal went from close to 80% share in 1910 about 30% by 1950. They can and do happen, but they take time. But how do we know if a change will ever happen, or if we are waiting for a fantasy that will never come to fruition? This is a better question as just because change can happen it does not mean that it will happen towards cleaner forms of energy. One simple way is to look at the percentage of new capacity coming from these sources, as that will likely be a leading indicator of what generation will look like in future years. Solar and wind have been very large shares of new capacity being added. For example in the month of September 2012, wind and solar were 100% of new capacity added according to the FERC. You can also see the share in generation increasing as well, with non-hydro renewables going from 3.1% of generation in 2008 to a forecasted 6.0% in 2013 per the Energy Information Administration. I believe that these are clear signs that a transformation is underway and given the falling costs for sources such as solar, believe that this trend will continue.

#### Renewables cost-competitive

Gloystein 11 (Henning, “Renewable energy becoming cost competitive, IEA says”, 11/23, http://www.reuters.com/article/2011/11/23/us-energy-iea-renewables-idUSTRE7AM0OV20111123)

Renewable energy technology is becoming increasingly cost competitive and growth rates are in line to meet levels required of a sustainable energy future, the International Energy Agency (IEA) said in a report on Wednesday. The report also said subsidies in green energy technologies that were not yet competitive are justified in order to give an incentive to investing into technologies with clear environmental and energy security benefits. The renewable electricity sector has grown rapidly in the past five years and now provides nearly 20 percent of the world's power generation, the IEA said during the presentation of the report titled Deploying Renewables 2011. The IEA's report disagreed with claims that renewable energy technologies are only viable through costly subsidies and not able to produce energy reliably to meet demand. "A portfolio of renewable energy (RE) technologies is becoming cost-competitive in an increasingly broad range of circumstances, in some cases providing investment opportunities without the need for specific economic support," the IEA said, and added that "cost reductions in critical technologies, such as wind and solar, are set to continue." "The portfolio of RE technologies, which includes established hydro power, geothermal and bioenergy technologies is now, therefore, cost-competitive in an increasingly broad range of circumstances, providing investment opportunities without the need for specific economic support."

## Warming Debate

### Anthropogenic

#### Global Warming is happening – most recent and best evidence concludes that it is human induced

Muller 7-28-2012 [Richard, professor of physics at the University of California, Berkeley, and a former MacArthur Foundation fellow, “The Conversion of a Climate-Change Skeptic”, http://www.nytimes.com/2012/07/30/opinion/the-conversion-of-a-climate-change-skeptic.html?pagewanted=all]

CALL me a converted skeptic. Three years ago I identified problems in previous climate studies that, in my mind, threw doubt on the very existence of global warming. Last year, following an intensive research effort involving a dozen scientists, I concluded that global warming was real and that the prior estimates of the rate of warming were correct. I’m now going a step further: Humans are almost entirely the cause. My total turnaround, in such a short time, is the result of careful and objective analysis by the Berkeley Earth Surface Temperature project, which I founded with my daughter Elizabeth. Our results show that the average temperature of the earth’s land has risen by two and a half degrees Fahrenheit over the past 250 years, including an increase of one and a half degrees over the most recent 50 years. Moreover, it appears likely that essentially all of this increase results from the human emission of greenhouse gases. These findings are stronger than those of the Intergovernmental Panel on Climate Change [IPCC], the United Nations group that defines the scientific and diplomatic consensus on global warming. In its 2007 report, the I.P.C.C. concluded only that most of the warming of the prior 50 years could be attributed to humans. It was possible, according to the I.P.C.C. consensus statement, that the warming before 1956 could be because of changes in solar activity, and that even a substantial part of the more recent warming could be natural. Our Berkeley Earth approach used sophisticated statistical methods developed largely by our lead scientist, Robert Rohde, which allowed us to determine earth land temperature much further back in time. We carefully studied issues raised by skeptics: biases from urban heating (we duplicated our results using rural data alone), from data selection (prior groups selected fewer than 20 percent of the available temperature stations; we used virtually 100 percent), from poor station quality (we separately analyzed good stations and poor ones) and from human intervention and data adjustment (our work is completely automated and hands-off). In our papers we demonstrate that none of these potentially troublesome effects unduly biased our conclusions. The historic temperature pattern we observed has abrupt dips that match the emissions of known explosive volcanic eruptions; the particulates from such events reflect sunlight, make for beautiful sunsets and cool the earth’s surface for a few years. There are small, rapid variations attributable to El Niño and other ocean currents such as the Gulf Stream; because of such oscillations, the “flattening” of the recent temperature rise that some people claim is not, in our view, statistically significant. What has caused the gradual but systematic rise of two and a half degrees? We tried fitting the shape to simple math functions (exponentials, polynomials), to solar activity and even to rising functions like world population. By far the best match was to the record of atmospheric carbon dioxide (CO2), measured from atmospheric samples and air trapped in polar ice.

#### CO2 is the primary driver of climate change – outweighs all alt causes

Vertessy and Clark3-13**-**2012[Rob, Acting Director of Australian Bureau of Meteorology, and Megan, Chief Executive Officer at the Commonwealth Scientific and Industrial Research Organisation, “State of the Climate 2012”, <http://theconversation.edu.au/state-of-the-climate-2012-5831>]

Carbon dioxide (CO2) emissions account for about 60% of the effect from anthropogenic greenhouse gases on the earth’s energy balance over the past 250 years. These global CO2 emissions are mostly from fossil fuels (more than 85%), land use change, mainly associated with tropical deforestation (less than 10%), and cement production and other industrial processes (about 4%). Australia contributes about 1.3% of the global CO2 emissions. Energy generation continues to climb and is dominated by fossil fuels – suggesting emissions will grow for some time yet. CO2 levels are rising in the atmosphere and ocean. About 50% of the amount of CO2 emitted from fossil fuels, industry, and changes in land-use, stays in the atmosphere. The remainder is taken up by the ocean and land vegetation, in roughly equal parts. The extra carbon dioxide absorbed by the oceans is estimated to have caused about a 30% increase in the level of ocean acidity since pre-industrial times. The sources of the CO2 increase in the atmosphere can be identified from studies of the isotopic composition of atmospheric CO2 and from oxygen (O2) concentration trends in the atmosphere. The observed trends in the isotopic (13C, 14C) composition of CO2 in the atmosphere and the decrease in the concentration of atmospheric O2 confirm that the dominant cause of the observed CO2 increase is the combustion of fossil fuels.

### Tipping Points

#### Positive feedbacks ensure runaway warming, causes extinction

Speth 2008[James, dean of the Yale School of Forestry and Environmental Studies at Yale University, New Haven, Connecticut. Currently he serves the school as the Carl W. Knobloch, Jr. Dean and Sara Shallenberger Brown Professor in the Practice of Environmental Policy, The Bridge @ the Edge of the World, pg. 26]

The possibility of abrupt climate change is linked to what may be the most problematic possibility of all—"positive" feedback effects where the initial warming has effects that generate more warming. Several of these feedbacks are possible. First, the land's ability to store carbon could weaken. Soils and forests can dry out or burn and release carbon; less plant growth can occur, thus reducing nature's ability to remove carbon from the air. Second, carbon sinks in the oceans could also be reduced due to ocean warming and other factors. Third, the potent greenhouse gas methane could be released from peat bogs, wetlands, and thawing permafrost, and even from the methane hydrates in the oceans, as the planet warms and changes. Finally, the earth's albedo, the reflectivity of the earth's surface, is slated to be reduced as large areas now covered by ice and snow diminish or are covered by meltwater. All these effects would tend to make warming self-reinforcing, possibly leading to a greatly amplified greenhouse effect. The real possibility of these amplifying feedbacks has alarmed some of our top scientists. James Hansen, the courageous NASA climate scientist, is becoming increasingly outspoken as his investigations lead him to more and more disturbing conclusions. He offered the following assessment in 2007: "Our home planet is now dangerously near a 'tipping point.' Human-made greenhouse gases are near a level such that important climate changes may proceed mostly under the climate system's own momentum. Impacts would include extermination of a large fraction of species on the planet, shifting of climatic zones due to an intensified hydrologic cycle with effects on freshwater availability and human health, and repeated worldwide coastal tragedies associated with storms and a continuously rising sea level. .. . "Civilization developed during the Holocene, a period of relatively tranquil climate now almost 12,000 years in duration. The planet has been warm enough to keep ice sheets off North America and Europe, but cool enough for ice sheets on Greenland and Antarctica to be stable. Now, with rapid warming of o.6°C in the past 30 years, global temperature is at its warmest level in the Holocene. "This warming has brought us to the precipice of a great 'tipping point” If we go over the edge, it will be a transition to 'a different planet,' an environment far outside the range that has been experienced by humanity. There will be no return within the lifetime of any generation that can be imagined, and the trip will exterminate a large fraction of species on the planet.

#### Not too late – every reduction key

Nuccitelli 12

[Dana, is an environmental scientist at a private environmental consulting firm in the Sacramento, California area. He has a Bachelor's Degree in astrophysics from the University of California at Berkeley, and a Master's Degree in physics from the University of California at Davis. He has been researching climate science, economics, and solutions as a hobby since 2006, and has contributed to Skeptical Science since September, 2010, <http://www.skepticalscience.com/realistically-what-might-future-climate-look-like.html>, HM]

We're not yet committed to surpassing 2°C global warming, but as Watson noted, we are quickly running out of time to realistically give ourselves a chance to stay below that 'danger limit'. However, 2°C is not a do-or-die threshold. Every bit of CO2 emissions we can reduce means that much avoided future warming, which means that much avoided climate change impacts. As Lonnie Thompson noted, the more global warming we manage to mitigate, the less adaption and suffering we will be forced to cope with in the future. Realistically, based on the current political climate (which we will explore in another post next week), limiting global warming to 2°C is probably the best we can do. However, there is a big difference between 2°C and 3°C, between 3°C and 4°C, and anything greater than 4°C can probably accurately be described as catastrophic, since various tipping points are expected to be triggered at this level. Right now, we are on track for the catastrophic consequences (widespread coral mortality, mass extinctions, hundreds of millions of people adversely impacted by droughts, floods, heat waves, etc.). But we're not stuck on that track just yet, and we need to move ourselves as far off of it as possible by reducing our greenhouse gas emissions as soon and as much as possible. There are of course many people who believe that the planet will not warm as much, or that the impacts of the associated climate change will be as bad as the body of scientific evidence suggests. That is certainly a possiblity, and we very much hope that their optimistic view is correct. However, what we have presented here is the best summary of scientific evidence available, and it paints a very bleak picture if we fail to rapidly reduce our greenhouse gas emissions. If we continue forward on our current path, catastrophe is not just a possible outcome, it is the most probable outcome. And an intelligent risk management approach would involve taking steps to prevent a catastrophic scenario if it were a mere possibility, let alone the most probable outcome. This is especially true since the most important component of the solution - carbon pricing - can be implemented at a relatively low cost, and a far lower cost than trying to adapt to the climate change consequences we have discussed here (Figure 4).

### A2 Adaptation

#### The rate of climate change prevents adaptation

Romm ’07 [Joseph, Senior Fellow at Center for American Progress, Aug 29, “Hurricane Katrina and the Myth of Global Warming Adaptation,” http://gristmill.grist.org/story/2007/8/29/94352/7786]

If we won't adapt to the realities of having one city below sea level in hurricane alley, what are the chances we are going to adapt to the realities of having all our great Gulf and Atlantic Coast cities at risk for the same fate as New Orleans -- since sea level from climate change will ultimately put many cities, like Miami, below sea level? And just how do you adapt to sea levels rising 6 to 12 inches a decade for centuries, which well may be our fate by 2100 if we don't reverse greenhouse-gas emissions trends soon. Climate change driven by human-caused GHGs is already happening much faster than past climate change from natural causes -- and it is accelerating.

#### Even if adaptation was possible – non-linear impacts disrupt the process

Mazo 2010 [Jeffrey Mazo, Managing Editor, Survival and Research Fellow for Environmental Security and Science Policy at the International Institute for Strategic Studies in London, 3-2010, “Climate Conflict: How global warming threatens security and what to do about it,” pg. 29]

This latter aspect, the rate of change, is a critical factor in terms of adapting to climate change. Although some states and societies will be better able to adapt to change than others, regardless of how resilient a given society is there will always be some point at which its efforts would be overwhelmed by the pace of change. Changes in climate - long-term wind and rainfall patterns, daily and seasonal temperature variations, and so on - will produce physical effects such as droughts, floods and increasing severity of typhoons and hurricanes, and ecological effects such as changes in the geographical range of species (including disease-causing organisms, domesticated crops and crop pests). These physical changes in turn may lead to effects such as disruption of water resources, declining crop yields and food stocks, wildfires, severe disease outbreaks, and an increase in numbers of refugees and internally displaced persons.4

### Impact – Ag

#### Even a small rise in global temperature would lead to mass starvation despite CO2 fertilization resulting in extinction

Robert Strom, Professor Emeritus of planetary sciences in the Department of Planetary Sciences at the University of Arizona, 2007(studied climate change for 15 years, the former Director of the Space Imagery Center, a NASA Regional Planetary Image Facility, “Hot House”, SpringerLink, p. 211-216)

THE future consequences of global warming are the least known aspect of the problem. They are based on highly complex computer models that rely on inputs that are sometimes not well known or factors that may be completely unforeseen. Most models assume certain scenarios concerning the rise in greenhouse gases. Some assume that we continue to release them at the current rate of increase while others assume that we curtail greenhouse gas release to one degree or another. Furthermore, we are in completely unknown territory. The current greenhouse gas content of the atmosphere has not been as high in at least the past 650,000 years, and the rise in temperature has not been as rapid since civilization began some 10,000 years ago. What lies ahead for us is not completely understood, but it certainly will not be good, and it could be catastrophic. We know that relatively minor climatic events have had strong adverse effects on humanity, and some of these were mentioned in previous chapters. A recent example is the strong El Nin~o event of 1997-1998 that caused weather damage around the world totaling $100 billion: major flooding events in China, massive fires in Borneo and the Amazon jungle, and extreme drought in Mexico and Central America. That event was nothing compared to what lies in store for us in the future if we do nothing to curb global warming. We currently face the greatest threat to humanity since civilization began. This is the crucial, central question, but it is very difficult to answer (Mastrandea and Schneider, 2004). An even more important question is: "At what temperature and environmental conditions is a threshold crossed that leads to an abrupt and catastrophic climate change?'' It is not possible to answer that question now, but we must be aware that in our ignorance it could happen in the not too distant future. At least the question of a critical temperature is possible to estimate from studies in the current science literature. This has been done by the Potsdam Institute for Climate Impact Research, Germany's leading climate change research institute (Hare, 2005). According to this study, global warming impacts multiply and accelerate rapidly as the average global temperature rises. We are certainly beginning to see that now. According to the study, as the average global temperature anomaly rises to 1 °C within the next 25 years (it is already 0.6'C in the Northern Hemisphere), some specialized ecosystems become very stressed, and in some developing countries food production will begin a serious decline, water shortage problems will worsen, and there will be net losses in the gross domestic product (GDP). At least one study finds that because of the time lags between changes in radiative forcing we are in for a 1 °C increase before equilibrating even if the radiative forcing is fixed at today's level (Wetherald et al., 2001). It is apparently when the temperature anomaly reaches 2 °C that serious effects will start to come rapidly and with brute force (International Climate Change Taskforce, 2005). At the current rate of increase this is expected to happen sometime in the middle of this century. At that point there is nothing to do but try to adapt to the changes. Besides the loss of animal and plant species and the rapid exacerbation of our present problems, there are likely to be large numbers of hungry, diseased and starving people, and at least 1.5 billion people facing severe water shortages. GDP losses will be significant and the spread of diseases will be widespread (see below). We are only about 30 years away from the 440 ppm CO2 level where the eventual 2'C global average temperature is probable. When the temperature reaches 3 'C above today's level, the effects appear to become absolutely critical. At the current rate of greenhouse gas emission, that point is expected to be reached in the second half of the century. For example, it is expected that the Amazon rainforest will become irreversibly damaged leading to its collapse, and that the complete destruction of coral reefs will be widespread. As these things are already happening, this picture may be optimistic. As for humans, there will be widespread hunger and starvation with up to 5.5 billion people living in regions with large crop losses and another 3 billion people with serious water shortages. If the Amazon rainforest collapses due to severe drought it would result in decreased uptake of CO2 from the soil and vegetation of about 270 billion tons, resulting in an enormous increase in the atmospheric level of CO2. This, of course, would lead to even hotter temperatures with catastrophic results for civilization. A Regional Climate Change Index has been established that estimates the impact of global warming on various regions of the world (Giorgi, 2006). The index is based on four variables that include changes in surface temperature and precipitation in 2080-2099 compared to the period 1960-1979. All regions of the world are affected significantly, but some regions are much more vulnerable than others. The biggest impacts occur in the Mediterranean and northeastern European regions, followed by high-latitude Northern Hemisphere regions and Central America. Central America is the most affected tropical region followed by southern equatorial Africa and southeast Asia. Other prominent mid-latitude regions very vulnerable to global warming are eastern North America and central Asia. It is entirely obvious that we must start curtailing greenhouse gas emissions now, not 5 or 10 or 20 years from now. Keeping the global average temperature anomaly under 2'C will not be easy according to a recent report (Scientific Expert Group Report on Climate Change, 2007). It will require a rapid worldwide reduction in methane, and global CO2 emissions must level off to a concentration not much greater than the present amount by about 2020. Emissions would then have to decline to about a third of that level by 2100. Delaying action will only insure a grim future for our children and grandchildren. If the current generation does not drastically reduce its greenhouse gas emission, then, unfortunately, our grandchildren will get what we deserve. There are three consequences that have not been discussed in previous chapters but could have devastating impacts on humans: food production, health, and the economy. In a sense, all of these topics are interrelated, because they affect each other. Food Production Agriculture is critical to the survival of civilization. Crops feed not only us but also the domestic animals we use for food. Any disruption in food production means a disruption of the economy, government, and health. The increase in CO2 will result in some growth of crops, and rising temperatures will open new areas to crop production at higher latitudes and over longer growing seasons; however, the overall result will be decreased crop production in most parts of the world. A 1993 study of the effects of a doubling of CO2 (550 ppm) above pre-industrial levels shows that there will be substantial decreases in the world food supply (Rosenzweig et al., 1993). In their research they studied the effects of global warming on four crops (wheat, rice, protein feed, and coarse grain) using four scenarios involving various adaptations of crops to temperature change and CO2 abundance. They found that the amount of world food reduction ranged from 1 to 27%. However, the optimistic value of 1% is almost certainly much too low, because it assumed that the amount of degradation would be offset by more growth from "CO2 fertilization." We now know that this is not the case, as explained below and in Chapter 7. The most probable value is a worldwide food reduction between 16 and 27%. These scenarios are based on temperature and CO2 rises that may be too low, as discussed in Chapter 7. However, even a decrease in world food production of 16% would lead to large-scale starvation in many regions of the world. Large-scale experiments called Free-Air Concentration Enrichment have shown that the effects of higher CO2 levels on crop growth is about 50% less than experiments in enclosure studies (Long et al., 2006). This shows that the projections that conclude that rising CO2 will fully offset the losses due to higher temperatures are wrong. The downside of climate change will far outweigh the benefits of increased CO2 and longer growing seasons. One researcher (Prof. Long) from the University of Illinois put it this way: Growing crops much closer to real conditions has shown that increased levels of carbon dioxide in the atmosphere will have roughly half the beneficial effects previously hoped for in the event of climate change. In addition, ground-level ozone, which is also predicted to rise but has not been extensively studied before, has been shown to result in a loss of photosynthesis and 20 per cent reduction in crop yield. Both these results show that we need to seriously re-examine our predictions for future global food production, as they are likely to be far lower than previously estimated. Also, studies in Britain and Denmark show that only a few days of hot temperatures can severely reduce the yield of major food crops such as wheat, soy beans, rice, and groundnuts if they coincide with the flowering of these crops. This suggests that there are certain thresholds above which crops become very vulnerable to climate change. The European heat wave in the summer of 2003 provided a large-scale experiment on the behavior of crops to increased temperatures. Scientists from several European research institutes and universities found that the growth of plants during the heat wave was reduced by nearly a third (Ciais et al., 2005). In Italy, the growth of corn dropped by about 36% while oak and pine had a growth reduction of 30%. In the affected areas of the mid- west and California the summer heat wave of 2006 resulted in a 35% loss of crops, and in California a 15% decline in dairy production due to the heat-caused death of dairy cattle. It has been projected that a 2 °C rise in local temperature will result in a $92 million loss to agriculture in the Yakima Valley of Washington due to the reduction of the snow pack. A 4'C increase will result in a loss of about $163 million. For the first time, the world's grain harvests have fallen below the consumption level for the past four years according to the Earth Policy Institute (Brown, 2003). Furthermore, the shortfall in grain production increased each year, from 16 million tons in 2000 to 93 million tons in 2003. These studies were done in industrialized nations where agricultural practices are the best in the world. In developing nations the impact will be much more severe. It is here that the impact of global warming on crops and domestic animals will be most felt. In general, the world's most crucial staple food crops could fall by as much as one-third because of resistance to flowering and setting of seeds due to rising temperatures. Crop ecologists believe that many crops grown in the tropics are near, or at, their thermal limits. Already research in the Philippines has linked higher night-time temperatures to a reduction in rice yield. It is estimated that for rice, wheat, and corn, the grain yields are likely to decline by 10% for every local 1 °C increase in temperature. With a decreasing availability of food, malnutrition will become more frequent accompanied by damage to the immune system. This will result in a greater susceptibility to spreading diseases. For an extreme rise in global temperature (> 6 'C), it is likely that worldwide crop failures will lead to mass starvation, and political and economic chaos with all their ramifications for civilization.

### Impact – Bio-D

#### Warming collapses Biodiversity

Bellard et al 2012 [Ce ́line Bellard, Cleo Bertelsmeier, Paul Leadley, Wilfried Thuiller and Franck Courchamp, “Impacts of climate change on the future of Biodiversity,” Ecology Letters, 15: 365–377, online]

Ecologists are developing a better understanding of the mechanisms by which species and ecosystems can be impacted by climate change. The timing of species life cycle events is expected to be further altered, species distributions will change radically, trophic networks will be affected and ecosystem functioning may be severely impaired, leading in the worst cases to countless species extinctions. Over the past decades, some of this understanding has been effectively translated into mathematical models that can be used to forecast climate change impacts on species distributions, abundance and extinctions. These models are characterised by their high diversity of underlying structures and assumptions, with predictions differing greatly depending on the models used and species studied. Most of these models indicate alarming consequences for Biodiversity with worst-case scenarios leading to extinction rates that would qualify as the sixth mass extinction in the history of the earth (Barnosky et al. 2011). However, all current approaches have serious weaknesses. An evaluation of known mechanisms of climate impacts on Biodiversity suggests that the lack of several key mechanisms in models may lead to either very large underestimations or overestimations of risks for Biodiversity. Improvements in existing models and, in particular, a new generation of models must address the shortcomings of current models to reduce uncertainties. It is also crucial to improve our understanding of the vulnerability of Biodiversity to climate change, to develop other predictive approaches and to go beyond predictions.

#### Extinction

CASBRC, 2001(California Academy of Sciences Biodiversity Resource Center, “Threats To Biodiversity”, http://researcharchive.calacademy.org/research/library/biodiv/biodiversity\_defined.html)

Currently, more than 10,000 species become extinct each year and while precise calculation is difficult, it is certain that this rate has increased alarmingly in recent years. The central cause of species extinction is destruction of natural habitats by human beings. Human survival itself may depend upon reversing this accelerating threat to species diversity. Among the millions of undescribed species are important new sources of food, medicine and other products. When a species vanishes, we lose access to the survival strategies encoded in its genes through millions of years of evolution. We lose the opportunity to understand those strategies which may hold absolutely essential options for our own future survival as a species. And we lose not only this unique evolutionary experience, but emotionally, we lose the unique beauty, and the unique spirit, which mankind has associated with that life form. Many indigenous human cultures have also been driven to extinction by the same forces which have destroyed and continue to threaten non-human species. It is estimated that since 1900 more than 90 tribes of aboriginal peoples have gone extinct in the Amazon Basin. Nearly every habitat on earth is at risk: the rainforests and coral reefs of the tropics, the salt marshes and estuaries of our coastal regions, the tundra of the circumpolar north, the deserts of Asia and Australia, the temperate forests of North America and Europe, the savannahs of Africa and South America. Tropical rainforests, for example, are among the most diverse of all terrestrial ecosystems. Covering only 7% of the planet's surface, these forests comprise 50-80% of the world's species. 40 million to 50 million acres of tropical forest vanish each year -- about 1.5 acres per second -- as trees are cut for lumber or land is cleared for agriculture or other development. It is estimated that perhaps a quarter of the Earth's total biological diversity is threatened with extinction within 20 to 30 years. The Academy's Commitment The California Academy of Sciences is a leader among the world's institutions for research in evolutionary biology. Staff researchers study biodiversity worldwide, describing more than 100 new species every year. Current projects include work in La Amistad Biosphere Reserve, Costa Rica; the Impenetrable Forest, Uganda; the coral reefs of New Guinea and Madagascar; the deserts of southwestern Asia; and Socorro Island off the west coast of Mexico. Approximately 1.4 million species of plants and animals have been described by scientists. Conservative estimates suggest that at least 5 million remain to be identified -- the vast majority of them in the tropics. Fewer than 1,500 biologists worldwide are now qualified to identify tropical species. If ever there was an urgent requirement for this expertise, it is now, in this time of rapid environmental erosion.

### Impact – CO2 Oceans

**Unchecked C02 levels acidifies the oceans – kills all marine life**

**Koebler 8/1**/12 – science and technology reporter for U.S. News & World Report (Jason, “NOAA: Oceans' Reefs at Risk From Carbon Emissions”, http://www.usnews.com/news/articles/2012/08/01/noaa-oceans-reefs-at-risk-from-carbon-emissions, CMR)

Not all carbon emissions find their way into Earth's atmosphere—about half of it is absorbed by vegetation and the world's oceans. On the one hand, that helps limit carbon's climate-changing effects. But on the other, it can deliver what a National Oceanic and Atmospheric Administration scientist calls a "double whammy" to the oceans. That's because carbon dioxide (CO2) is a weak acid, and when it's absorbed by water, it contributes to ocean acidification, which can kill **coral reefs** and **shellfish**, wreaking havoc on undersea plant and animal life. As humans have increased their carbon emissions over the past 100 years, vegetation and the world's surface oceans have been working overtime to absorb about half of it, about the same proportion as 50 years ago, according to the study, published Wednesday in Nature. "Humanity is getting an assist on climate change from natural systems, otherwise the carbon dioxide in the atmosphere would be twice as high," says Pieter Tans, one of the study's authors. "But CO2 is an acid and the amounts [being absorbed by the ocean] are **so massive** that I don't see how we can remedy coming acidification." Reforestation in parts of North America and China and deforestation slowdowns in other parts of the world have allowed plants to bear some of the burden, but he says the ocean is working overtime to pull in more carbon than ever before. But even though Earth is absorbing a similar proportion of carbon as it was 50 years ago, overall human emissions have **greatly increased**, meaning sea temperatures are rising even as they acidify. According to a Scripps Institution of Oceanography study released earlier this year, ocean temperatures have increased by about half a degree over the past 100 years; many scientists say that increase has been responsible for an increase in the **severity** and **frequency** of hurricanes. "Sea temperature change comes from climate change, but they're also acidifying," Tans says. "The oceans get a double whammy." While increasing carbon emissions may take longer to wreak havoc on the world's climate, it could deal a **death blow** to vulnerable coral reefs, which shelter millions of plant and animal species, Tans says. "Acidification is a concern for sea life—for the atmosphere, it's a good thing our oceans are absorbing so much carbon, but as the oceans acidify, it'll affect [coral reefs and shellfish], and **work its way up the food chain**," he says. "At some point, [reefs] are endangered. We're not too far away from that."

**Extinction**

Kristof 6 (NICHOLAS D. KRISTOF, American journalist, author, op-ed columnist, and a winner of two Pulitzer Prizes, “Scandal Below the Surface”, Oct 31, 2006, http://select.nytimes.com/2006/10/31/opinion/31kristof.html?\_r=1, CMR)

If you think of the earth’s surface as a great beaker, then it’s filled mostly with ocean water. It is slightly alkaline, and that’s what creates a hospitable home for fish, coral reefs and plankton — and indirectly, higher up the food chain, for us. But scientists have discovered that the carbon dioxide (CO2) we’re spewing into the air doesn’t just heat up the atmosphere and lead to rising seas. Much of that carbon is absorbed by the oceans, and there it produces carbonic acid — the same stuff found in soda pop. That makes oceans a bit more acidic, impairing the ability of certain shellfish to produce shells, which, like coral reefs, are made of calcium carbonate. A recent article in Scientific American explained the indignity of being a dissolving mollusk in an acidic ocean: “Drop a piece of chalk (calcium carbonate) into a glass of vinegar (a mild acid) if you need a demonstration of the general worry: the chalk will begin dissolving immediately.” The more acidic waters may spell the end, at least in higher latitudes, of some of the tiniest variations of shellfish — certain plankton and tiny snails called pteropods. This would **disrupt the food chain,** possibly killing off many whales and fish, and rippling up all the way to humans. We stand, so to speak, on the shoulders of plankton. “There have been a couple of very big events in geological history where the carbon cycle changed dramatically,” said Scott Doney, senior scientist at the Woods Hole Oceanographic Institution in Massachusetts. One was an abrupt warming that took place 55 million years ago in conjunction with acidification of the oceans and **mass extinctions**. Most scientists don’t believe we’re headed toward a man-made variant on that episode — not **yet**, at any rate. But many worry that we’re hurtling into unknown dangers. “Whether in 20 years or 100 years, I think marine ecosystems are going to be dramatically different by the end of this century, and that’ll lead to **extinction events**,” Mr. Doney added. “This is the only habitable planet we have,” he said. “The damage we do is going to be felt by **all the generations to come.”** So that should be one of the great political issues for this century — the vandalism we’re committing to our planet because of our refusal to curb greenhouse gases. Yet the subject is barely debated in this campaign. Changes in ocean chemistry are only one among many damaging consequences of carbon emissions. Evidence is also growing about the more familiar dangers: melting glaciers, changing rainfall patterns, rising seas and more powerful hurricanes. Last year, the World Health Organization released a study indicating that climate change results in an extra 150,000 deaths and five million sicknesses each year, by causing the spread of malaria, diarrhea, malnutrition and other ailments. A report prepared for the British government and published yesterday, the Stern Review on the Economics of Climate Change, warned that inaction “could create risks of major disruption to economic and social activity, on a scale similar to those associated with the great wars and the economic depression of the first half of the 20th century.” If emissions are not curbed, climate change will cut 5 percent to 20 percent of global G.D.P. each year, declared the mammoth report. “In contrast,” it said, “the costs of action — reducing greenhouse gas emissions to avoid the worst impacts of climate change — can be limited to around 1 percent of global G.D.P. each year.” Some analysts put the costs of action higher, but most agree that it makes sense to invest far more in alternative energy sources, both to wean ourselves of oil and to reduce the strain on our planet. We know what is needed: a carbon tax or cap-and-trade system, a post-Kyoto accord on emissions cutbacks, and major research on alternative energy sources. But as The Times’s Andrew Revkin noted yesterday, spending on energy research and development has fallen by more than half, after inflation, since 1979.

### Impact – Disease

#### Warming causes disease spread

Adair4-11-2012(KIRSTEN ADAIR, CONTRIBUTING REPORTER for Daily Yale News, Wednesday, April 11, 2012, http://www.yaledailynews.com/news/2012/apr/11/global-warming-may-intensify-disease/)

There may be more to fear from global warming than environmental changes. According to several leading climate scientists and public health researchers, global warming will lead to higher incidence and more intense versions of disease. The direct or indirect effects of global warming might intensify the prevalence of tuberculosis, HIV/AIDS, dengue and Lyme disease, they said, but the threat of increased health risks is likely to futher motivate the public to combat global warming. “The environmental changes wrought by global warming will undoubtedly result in major ecologic changes that will alter patterns and intensity of some infectious diseases,” said Gerald Friedland, professor of medicine and epidemiology and public health at the Yale School of Medicine. Global warming will likely cause major population upheavals, creating crowded slums of refugees, Friedland said. Not only do areas of high population density facilitate disease transmission, but their residents are more likely to be vulnerable to disease because of malnutrition and poverty, he said. This pattern of vulnerability holds for both tuberculosis and HIV/AIDS, increasing the incidence of both the acquisition and spread of the diseases, he explained. He said these potential effects are not surprising, since tuberculosis epidemics historically have followed major population and environmental upheavals. By contrast, global warming may increase the infection rates of mosquito-borne diseases by creating a more mosquito-friendly habitat. Warming, and the floods associated with it, are like to increase rates of both malaria and dengue, a debilitating viral disease found in tropical areas and transmitted by mosquito bites, said Maria Diuk-Wasser, assistant professor of epidemiology at the Yale School of Public Health. “The direct effects of temperature increase are an increase in immature mosquito development, virus development and mosquito biting rates, which increase contact rates (biting) with humans. Indirect effects are linked to how humans manage water given increased uncertainty in the water supply caused by climate change,” Diuk-Wasser said. Global warming may affect other diseases in even more complicated ways, Diuk-Wasser said. The effect of global warming on the incidence of Lyme disease, a tick-borne chronic disease, is more difficult to examine and measure, though she said it will probably increase. “One possible way in which temperature may limit tick populations is by increasing the length of their life cycle from two to three years in the north, where it is colder,” she said. “Climate change could be reverting that and therefore increasing production of ticks. The transmission of the Lyme bacterium is so complex, though, that it is difficult to ‘tease out’ a role of climate change.” Diuk-Wasser added, however, that scientists do find an effect of climate change on the distribution of Lyme disease in their data, but are not yet sure of the reasons behind such results. While the study of global warming itself is relatively new, research on the impact of global warming on disease is an even more recent endeavor that draws on the skills and expertise of a wide variety of scientists and researchers. “The field is multi-sourced, and recently interest has been evolving among climatologists, vector biologists, disease epidemiologists, ecologists, and policymakers alike,” said Uriel Kitron, professor and chair of the environmental studies department at Emory University. Kitron said that in order to mitigate the effects of global warming on disease, the public must turn its attention to water management and an increased understanding of the connecting between “global processes and local impact.” Diuk-Wasser said that raising awareness about the public health effects of global warming might aid climate control efforts, because it made the potential impact of global warming more personal. “There’s been a great interest in climate advocacy groups to look for negative effects of climate change on health, since studies have found that this motivates people to adopt measures to curb climate change,” Diuk-Wasser said. The Yale Climate and Engery Institute recently won a grant to study the direct and indirect effects of climate change on dengue transmission in Colombia.

#### Emerging diseases cause extinction

Zimmerman and Zimmerman 1996 (Barry and David, both have M.S. degrees from Long Island University, Killer Germs, p 132) EDITED FOR GENDERED LANGUAGE

Then came AIDS…and Ebola and Lassa fever and Marburg and dengue fever.  They came, for the most part, from the steamy jungles of the world.  Lush tropical rain forests are ablaze with deadly viruses.  And changing lifestyles as well as changing environmental conditions are flushing them out.  Air travel, deforestation, global warming are forcing never-before-encountered viruses to suddenly cross the path of humanity.  The result—emerging viruses. Today some five thousand vials of exotic viruses sit, freeze-dried, at Yale University—imports from the rain forests.  They await the outbreak of diseases that can be ascribed to them.  Many are carried by insects and are termed *arboviruses* (*ar*thropod *bo*rne).  Others, of even greater concern, are airborne and can simply be breathed in.  Some, no doubt, could threaten humanity’s very existence.  Joshua Lederberg, 1958 winner of the Nobel Prize in Physiology or Medicine and foremost authority on emerging viruses, warned in a December 1990 article in *Discover* magazine:  “It is still not comprehended widely that AIDS is a natural, almost predictable phenomenon.  It is not going to be a unique event.  Pandemics are not acts of God, but are built into the ecological relations between viruses, animal species and human species…There will be more surprises, because our fertile imagination does not begin to match all the tricks that nature can play…”  According to Lederberg, “The survival of humanity is not preordained…The single biggest threat to [hu]man’s continued dominance on the planet is the virus”  (*A Dancing Matrix*, by Robin Marantz Hening.

### Impact Calc - No War

#### Err aff on probability – risks of major war are almost ZERO

Fettweis, ‘6 – National Security Decision Making Department, US Naval War College [Christopher, “A Revolution in International Relation Theory: Or, What If Mueller Is Right?” International Studies Review (2006) 8, 677–697]

The obsolescence-of-major-war argument is familiar enough to need little introduction (Mueller 1989, 1995, 2004; see also Rosecrance 1986, 1999; Ray 1989; Kaysen 1990; Van Evera 1990–1991; Kegley 1993; Jervis 2002; Mandelbaum 2002). In its most basic and common form, the thesis holds that a broad shift in attitudes toward warfare has occurred within the most powerful states of the international system, virtually removing the possibility for the kind of war that pits the strongest states against each other. Major wars, fought by the most powerful members of the international system, are, in Michael Mandelbaum's (1998/1999:20) words, "somewhere between impossible and unlikely."  The argument is founded upon a traditional liberal faith in the possibility of moral progress within the society of great powers, which has created for the first time "an almost universal sense that the deliberate launching of a war can no longer be justified" (Ray 1989:425; also Luard 1986, 1989). To use Francis Fukayama's (1992) phrase, it is the "autonomous power of ideas" that has brought major war to an end. Whereas past leaders were at times compelled by the masses to use force in the defense of the national honor, today popular pressures urge peaceful resolutions to disputes between industrialized states. This normative shift has all but removed warfare from the set of options before policymakers, making it a highly unlikely outcome. Mueller (1989:11) has referred to the abolition of slavery and dueling as precedents. "Dueling, a form of violence famed and fabled for centuries, is avoided not merely because it has ceased to seem 'necessary,' but because it has sunk from thought as a viable, conscious possibility. You can't fight a duel if the idea of doing so never occurs to you or your opponent." By extension, states cannot fight wars if doing so does not occur to them or to their opponent. Major war has become, in Mueller's words, "sub-rationally unthinkable."  Obviously, the obsolescence-of-major-war argument is not without critics. First, and most basic, the literature is sometimes quite vague about what constitutes a "major war" and who exactly the "great powers" are. In Retreat from Doomsday, Mueller (1989) alternately describes his data set as consisting of "developed countries" (p. 4), the "first and second worlds" (p. 256), the "major and not-so-major countries" (p. 5), and the 44 wealthiest states (p. 252). Others refer to the great powers as those states with a certain minimum standard of living, especially those in Europe (Luard 1986:398); modern, "industrial societies" (Kaysen 1990); the "leading global powers" (Väyrynen 2006:13); or merely "the most powerful members of the international system" (Mandelbaum 1998/1999:21). What constitutes a "major" war is also often left unclear. Some analyses use arbitrary quantitative values (for example, 1,000 battle deaths); others study only world wars, those fought by the most powerful members of the international system, drawing on all their resources, with the potential to lead to outcomes of "revolutionary geopolitical consequences including the birth and death of regimes, the redrawing of borders, and the reordering of the hierarchy of sovereign states" (Mandelbaum 1998/1999:20).  Definitions are often the last refuge of academic scoundrels—many IR theories deal with potentially contradictory information by simply refining or redefining the data under consideration. Perhaps the best way to avoid this pitfall is to err on the side of inclusion, expanding the analysis as broadly as possible. While the obsolescence-of-major-war argument clearly covers the kind of catastrophic wars that Mandelbaum analyzes, any big war between industrialized, powerful states would render the proposition false. At its essence, like pornography, one knows major war when one sees it. Major powers will likely occasionally deem it in their interest to strike the minor, and at times small, states, especially those led by nondemocratic, unenlightened leaders. But societal unease at the continuation of small wars—such as those in Afghanistan and Iraq or between poor, weak states like Ethiopia and Eritrea—should be ameliorated by the knowledge that, for the first time in history, world war is exceedingly unlikely. Determining which states are great powers is slightly more complicated, but not by much. Two decades ago, Jack Levy (1983:10) noted that the importance of the concept of "great power" was not matched by anything approaching analytical precision in its use and the field has not progressed much since. Relevant states for this analysis are those with the potential to be great powers, whether that potential is realized or not. The choice not to devote a large portion of one's national resources toward territorial defense was not available to most states in other, bygone eras. If today's rich states can choose not to prepare for war without consequence, then the nature of the system may well have changed.  Broadly speaking, there is an indirect relationship between the relative level of development and the chances of being involved in a major war against a peer. In its most basic, inclusive, and falsifiable form, the obsolescence-of-major-war argument postulates that the most advanced countries—roughly speaking, those in the global north—are unlikely to fight one another ever again. Precise determination of which countries are in the "north" and which are not is less important than it may seem at first, since current versions of the argument do not restrict themselves to the great powers. As will be discussed below, if the logic behind the obsolescence-of-major-war argument is correct, a drastic diminution of all kinds of war everywhere may be on the horizon. It is important to note that this argument does not suggest that competition is coming to a conclusion, only that the means to compete have changed. Rivalry will continue; envy, hubris, and lust for power will likely never disappear. Rogues and outlaws will probably always plague humanity, but very rarely as leaders of powerful states, especially in the northern democracies. The Mueller argument merely holds that war need not follow from any of this, especially major wars. States can compete in nonviolent ways, addressing the logic of war with the grammar of commerce, to paraphrase Edward Luttwak (1990:19). The conflicts of the future may be fought in boardrooms rather than battlefields, using diplomacy, sanctions, and the methods of commerce rather than brute force.  One of the obvious strengths of the obsolescence-of-major-war argument is that it carries clear routes to falsification. It can be proven incorrect by virtually any big war in Western Europe, in the Pacific Rim, or in North America. If Japan attacks Australia, if the United States moves north, or if Germany rises again and makes another thrust at Paris and Moscow, Retreat from Doomsday will join The Great Illusion (Angell [1909] 1913) in the skeptical realist's list of utopian fantasies. Until that happens, however, scholars are left to explain one of the great anomalies in the history of the international system.  Most IR scholarship carries on as if such an anomaly simply does not exist. This is especially true of realists, whose theories typically leave little room for fundamental systemic change (Lebow 1994). "The game of politics does not change from age to age," argued a skeptical Colin Gray (1999:163), "let alone from decade to decade." Indeed, the most powerful counterargument to Mueller—and one that is ultimately unanswerable—is that this period of peace will be temporary and that someday these trends will be reversed. Neorealists traditionally contend that the anarchic structure of the system stacks the deck against long-term stability, which accounts for "war's dismal recurrence throughout the millennia," in the words of Kenneth Waltz (1989:44). Other scholars are skeptical about the explanatory power of ideas, at least as independent variables in models of state behavior (Mearsheimer 1994/1995; Brooks and Wohlforth 2000/2001; Copeland 2003).  However, one need not be convinced about the potential for ideas to transform international politics to believe that major war is extremely unlikely to recur. Mueller, Mandelbaum, Ray, and others may give primary credit for the end of major war to ideational evolution akin to that which made slavery and dueling obsolete, but others have interpreted the causal chain quite differently. Neoliberal institutionalists have long argued that complex economic interdependence can have a pacifying effect upon state behavior (Keohane and Nye 1977, 1987). Richard Rosecrance (1986, 1999) has contended that evolution in socio-economic organization has altered the shortest, most rational route to state prosperity in ways that make war unlikely. Finally, many others have argued that credit for great power peace can be given to the existence of nuclear weapons, which make aggression irrational (Jervis 1989; Kagan et al. 1999). With so many overlapping and mutually reinforcing explanations, at times the end of major war may seem to be overdetermined (Jervis 2002:8–9). For purposes of the present discussion, successful identification of the exact cause of this fundamental change in state behavior is probably not as important as belief in its existence. In other words, the outcome is far more important than the mechanism. The importance of Mueller's argument for the field of IR is ultimately not dependent upon why major war has become obsolete, only that it has.  Almost as significant, all these proposed explanations have one important point in common: they all imply that change will be permanent. Normative/ideational evolution is typically unidirectional—few would argue that it is likely, for instance, for slavery or dueling to return in this century. The complexity of economic interdependence is deepening as time goes on and going at a quicker pace. And, obviously, nuclear weapons cannot be uninvented and (at least at this point) no foolproof defense against their use seems to be on the horizon. The combination of forces that may have brought major war to an end seems to be unlikely to allow its return.  The twentieth century witnessed an unprecedented pace of evolution in all areas of human endeavor, from science and medicine to philosophy and religion. In such an atmosphere, it is not difficult to imagine that attitudes toward the venerable institution of war may also have experienced rapid evolution and that its obsolescence could become plausible, perhaps even probable, in spite of thousands of years of violent precedent. The burden of proof would seem to be on those who maintain that the "rules of the game" of international politics, including the rules of war, are the lone area of human interaction immune to fundamental evolution and that, due to these immutable and eternal rules, war will always be with us. Rather than ask how major war could have grown obsolete, perhaps scholars should ask why anyone should believe that it could not.

#### No nuclear war – deterrence

Tepperman 9—Deputy Editor at Newsweek. Frmr Deputy Managing Editor, Foreign Affairs. LLM, i-law, NYU. MA, jurisprudence, Oxford. (Jonathan, Why Obama Should Learn to Love the Bomb, <http://jonathantepperman.com/Welcome_files/nukes_Final.pdf>, CMR)

The argument that nuclear weapons can be agents of peace as well as destruction rests on two deceptively simple observations. First, nuclear weapons have not been used since 1945. Second, there’s never been a nuclear, or even a nonnuclear, war between two states that possess them. Just stop for a second and think about that: it’s hard to overstate how remarkable it is, especially given the singular viciousness of the 20th century. As Kenneth Waltz, the leading “nuclear optimist” and a professor emeritus of political science at UC Berkeley puts it, “We now have 64 years of experience since Hiroshima. It’s striking and against all historical precedent that for that substantial period, there has not been any war among nuclear states.” To understand why—and why the next 64 years are likely to play out the same way—you need to start by recognizing that all states are rational on some basic level. Their leaders may be stupid, petty, venal, even evil, but they tend to do things only when they’re pretty sure they can get away with them. Take war: a country will start a fight only when it’s almost certain it can get what it wants at an acceptable price. Not even Hitler or Saddam waged wars they didn’t think they could win. The problem historically has been that leaders often make the wrong gamble and underestimate the other side—and millions of innocents pay the price. Nuclear weapons change all that by making the costs of war obvious, inevitable, and unacceptable. Suddenly, when both sides have the ability to turn the other to ashes with the push of a button— and everybody knows it—the basic math shifts. Even the craziest tin-pot dictator is forced to accept that war with a nuclear state is unwinnable and thus not worth the effort. As Waltz puts it, “Why fight if you can’t win and might lose everything?” Why indeed? The iron logic of deterrence and mutually assured destruction is so compelling, it’s led to what’s known as the nuclear peace: the virtually unprecedented stretch since the end of World War II in which all the world’s major powers have avoided coming to blows. They did fight proxy wars, ranging from Korea to Vietnam to Angola to Latin America. But these never matched the furious destruction of full-on, great-power war (World War II alone was responsible for some 50 million to 70 million deaths). And since the end of the Cold War, such bloodshed has declined precipitously. Meanwhile, the nuclear powers have scrupulously avoided direct combat, and there’s very good reason to think they always will. There have been some near misses, but a close look at these cases is fundamentally reassuring—because in each instance, very different leaders all came to the same safe conclusion. Take the mother of all nuclear standoffs: the Cuban missile crisis. For 13 days in October 1962, the United States and the Soviet Union each threatened the other with destruction. But both countries soon stepped back from the brink when they recognized that a war would have meant curtains for everyone. As important as the fact that they did is the reason why: Soviet leader Nikita Khrushchev’s aide Fyodor Burlatsky said later on, “It is impossible to win a nuclear war, and both sides realized that, maybe for the first time.” The record since then shows the same pattern repeating: nuclear armed enemies slide toward war, then pull back, always for the same reasons. The best recent example is India and Pakistan, which fought three bloody wars after independence before acquiring their own nukes in 1998. Getting their hands on weapons of mass destruction didn’t do anything to lessen their animosity. But it did dramatically mellow their behavior. Since acquiring atomic weapons, the two sides have never fought another war, despite severe provocations (like Pakistani-based terrorist attacks on India in 2001 and 2008). They have skirmished once. But during that flare-up, in Kashmir in 1999, both countries were careful to keep the fighting limited and to avoid threatening the other’s vital interests. Sumit Ganguly, an Indiana University professor and coauthor of the forthcoming India, Pakistan, and the Bomb, has found that on both sides, officials’ thinking was strikingly similar to that of the Russians and Americans in 1962. The prospect of war brought Delhi and Islamabad face to face with a nuclear holocaust, and leaders in each country did what they had to do to avoid it.

#### Miscalc is impossible

Quinlan ‘9 (Sir Michael, visiting professor at King's College London, Permanent Under-Secretary at the Ministry of Defence and former senior fellow at the International Institute of Strategic Studies, “Thinking About Nuclear Weapons: Principles, Problems, Prospects,” Oxford University Press, CMR)

One special form of miscalculation appeared sporadically in the speculations of academic commentators, though it was scarcely ever to be encountered—at least so far as my own observation went—in the utterances of practical planners within government. This is the idea that nuclear war might be erroneously triggered, or erroneously widened, through a state under attack misreading either what sort of attack it was being subjected to, or where the attack came from. The postulated misreading of the nature of the attack referred in particular to the hypothesis that if a delivery system—normally a missile—that was known to be capable of carrying either a nuclear or a conventional warhead was launched in a conventional role, the target country might, on detecting the launch through its early warning systems, misconstrue the mission as an imminent nuclear strike and immediately unleash a nuclear counter-strike of its own. This conjecture was voiced, for example, as a criticism of the proposals for giving the US Trident SLBM, long associated with nuclear missions, a capability to deliver conventional warheads. Whatever the merit of those proposals (it is not explored here), it is hard to regard this particular apprehension as having any real-life credibility. The ﬂight time of a ballistic missile would not exceed about thirty minutes, and that of a cruise missile a few hours, before arrival on target made its character—conventional or nuclear—unmistakable. No government will need, and no nonlunatic government could wish, to take within so short a span of time a step as enormous and irrevocable as the execution of a nuclear strike on the basis of early-warning information alone without knowing the true nature of the incoming attack. The speculation tends moreover to be expressed without reference either to any realistic political or conﬂict-related context thought to render the episode plausible, or to the manifest interest of the launching country, should there be any risk of doubt, in ensuring—by explicit communication if necessary—that there was no misinterpretation of its conventionally armed launch.

#### Interdependence checks

Deudney ‘9, Prof of Pol Sci, and Ikenberry, Prof of International Affairs (Daniel and John, Prof of Pol Sci at John Hopkins and Prof of International Affairs at Princeton, “Why Liberal Democracy Will Prevail” <http://www.nwc.navy.mil/events/csf/readings/AutocraticRevival.aspx>, CMR)

This bleak outlook is based on an exaggeration of recent developments and ignores powerful countervailing factors and forces. Indeed, contrary to what the revivalists describe, the most striking features of the contemporary international landscape are the intensification of economic globalization, thickening institutions, and shared problems of interdependence. The overall structure of the international system today is quite unlike that of the nineteenth century. Compared to older orders, the contemporary liberal-centered international order provides a set of constraints and opportunities — of pushes and pulls — that reduce the likelihood of severe conflict while creating strong imperatives for cooperative problem solving. Those invoking the nineteenth century as a model for the twenty-first also fail to acknowledge the extent to which war as a path to conflict resolution and great-power expansion has become largely obsolete. Most important, nuclear weapons have transformed great-power war from a routine feature of international politics into an exercise in national suicide. With all of the great powers possessing nuclear weapons and ample means to rapidly expand their deterrent forces, warfare among these states has truly become an option of last resort. The prospect of such great losses has instilled in the great powers a level of caution and restraint that effectively precludes major revisionist efforts. Furthermore, the diffusion of small arms and the near universality of nationalism have severely limited the ability of great powers to conquer and occupy territory inhabited by resisting populations (as Algeria, Vietnam, Afghanistan, and now Iraq have demonstrated). Unlike during the days of empire building in the nineteenth century, states today cannot translate great asymmetries of power into effective territorial control; at most, they can hope for loose hegemonic relationships that require them to give something in return. Also unlike in the nineteenth century, today the density of trade, investment, and production networks across international borders raises even more the costs of war. A Chinese invasion of Taiwan, to take one of the most plausible cases of a future interstate war, would pose for the Chinese communist regime daunting economic costs, both domestic and international. Taken together, these changes in the economy of violence mean that the international system is far more primed for peace than the autocratic revivalists acknowledge.

### Impact Calc – Nuke War Defense

#### Nuclear war doesn’t cause extinction

Yehoshua Socol (Ph.D.), an inter-disciplinary physicist, is an expert in electro-optics, high-energy physics and applications, and material science and Moshe Yanovskiy, Jan 2, 2011, “Nuclear Proliferation and Democracy”, http://www.americanthinker.com/2011/01/nuclear\_proliferation\_and\_demo.html, CMR

Nuclear proliferation should no longer be treated as an unthinkable nightmare; it is likely to be the future reality. Nuclear weapons have been acquired not only by an extremely poor per capita but large country such as India, but also by even poorer and medium-sized nations such as Pakistan and North Korea. One could also mention South Africa, which successfully acquired a nuclear arsenal despite economic sanctions (the likes of which have not yet been imposed on Iran). It is widely believed that sanctions and rhetoric will not prevent Iran from acquiring nuclear weapons and that many countries, in the Middle East and beyond, will act accordingly (see, e.g., recent Heritage report). Nuclear Warfare -- Myths And Facts The direct consequences of the limited use of nuclear weapons -- especially low-yield devices most likely to be in the hands of non-state actors or irresponsible governments -- **would** probably **not be great enough** to bring about significant geopolitical upheavals. Casualties from a single 20-KT nuclear device are estimated [1] at about 25,000 fatalities with a similar number of injured, assuming a rather unfortunate scenario (the center of a large city, with minimal warning). Scaling the above toll to larger devices or to a larger number of devices is less than linear. For example, it has been estimated that it would take as many as eighty devices of 20-KT yield each to cause 300,000 civilian fatalities in German cities (a result actually achieved by Allied area attacks, or carpet-bombings, during the Second World War). A single 1-MT device used against Detroit has been estimated by U.S. Congress OTA to result in about 220,000 fatalities. It is anticipated that well-prepared civil defense measures, based on rather simple presently known techniques, would decrease these numbers by maybe an order of magnitude (as will be discussed later). There is little doubt that a nation determined to survive and with a strong sense of its own destiny **would not succumb to** such **losses**. It is often argued that the fallout effects of even the limited use of nuclear weapons would be worldwide and would last for generations. This is an **exaggeration**. The following facts speak for themselves. -- In Japan, as assessed by REFR, less than 1,000 excess cancer cases (i.e., above the natural occurrence) were recorded in over 100,000 survivors over the past sixty years -- compared with about 110,000 immediate fatalities in the two atomic bombings. No clinical or even sub-clinical effects were discovered in the survivors' offspring. -- In the Chernobyl area, as assessed by IAEA, only fifteen cancer deaths can be directly attributed to fallout radiation. No radiation-related increase in congenital formations was recorded. Nuclear Conflict -- Possible Scenarios With reference to a possible regional nuclear conflict between a rogue state and a democratic one, the no-winner (mutual assured destruction) scenario is probably false. An analysis by Anthony Cordesman, et al. regarding a possible Israel-Iran nuclear conflict estimated that while Israel might survive an Iranian nuclear blow, Iran would certainly not survive as an organized society. Even though the projected casualties cited in that study seem to us overstated, especially as regards Israel, the conclusion rings true. Due to the extreme high intensity ("above-conventional") of nuclear conflict, it is nearly certain that such a war, no matter its outcome, **would not last for years,** as we have become accustomed to in current low-intensity conflicts. Rather, we should anticipate a new geo-political reality: the emergence of clear winners and losers **within** several **days**, or at most weeks after the initial outbreak of hostilities. This latter reality will most probably contain fewer nuclear-possessing states than the former.

**No nuke winter - studies**

Seitz 11, Harvard University Center for International Affairs visiting scholar, (Russell, “Nuclear winter was and is debatable,” Nature, 7-7-11, Vol 475, pg37, accessed 9-27-11, CMR)

Alan Robock's contention that there has been no real scientific debate about the 'nuclear winter' concept is itself **debatable** (Nature 473, 275–276; 2011). This potential climate disaster, popularized in Science in 1983, rested on the output of a one-dimensional model that was later shown to overestimate the smoke a nuclear holocaust might engender. More refined estimates, combined with advanced three-dimensional models (see http://go.nature.com.libproxy.utdallas.edu/kss8te), have dramatically reduced the extent and severity of the projected cooling. Despite this, Carl Sagan, who co-authored the 1983 Science paper, went so far as to posit “the extinction of Homo sapiens” (C. Sagan Foreign Affairs 63, 75–77; 1984). Some regarded this apocalyptic prediction as **an exercise in mythology**. George Rathjens of the Massachusetts Institute of Technology protested: “Nuclear winter is **the worst example of the misrepresentation of science to the public in my memory**,” (see http://go.nature.com.libproxy.utdallas.edu/yujz84) and climatologist Kerry Emanuel observed that the subject had “become **notorious for its lack of scientific integrity”** (Nature 319, 259; 1986). Robock's single-digit fall in temperature is at odds with the subzero (about −25 °C) continental cooling originally projected for a wide spectrum of nuclear wars. Whereas Sagan predicted darkness at noon from a US–Soviet nuclear conflict, Robock projects global sunlight that is several orders of magnitude brighter for a Pakistan–India conflict — literally the difference between night and day. Since 1983, the projected worst-case cooling has fallen from a Siberian deep freeze spanning 11,000 degree-days Celsius (a measure of the severity of winters) to numbers so unseasonably small as to call the very term 'nuclear winter' into question.

# Oil DA Aff

## Renewables

### Transition Fails

#### Transition not happening – fossil fuels outpacing renewables

Plumer, 7/10 (Brad, Washington Post, “Bad news: The world’s energy supply isn’t getting any cleaner”, 2013, http://www.washingtonpost.com/blogs/wonkblog/wp/2013/07/10/bad-news-fossil-fuels-are-more-than-keeping-up-with-clean-energy/)

We’ve seen plenty of charts over the past few years showing that wind and solar power are growing at astronomical rates — not just in the United States, but around the world. That seems like an encouraging sign for efforts to tackle global warming. But here’s a sobering counterpoint. Roger Pielke, Jr., an environmental studies professor at the University of Colorado, has charted data on the share of carbon-free energy as a fraction of the world’s overall consumption. When you look at things this way, the share of clean energy around the world has actually stagnated over the past 20 years: It’s true that carbon-free sources like wind and solar and hydropower and geothermal have been growing rapidly. But fossil fuels like oil, coal, and natural gas have also been growing rapidly in the past two decades — particularly in China and India. The result is a stalemate of sorts. The world’s energy supply isn’t any cleaner than it was in the 1990s. (By the way, fans of nuclear will note that the share of carbon-free energy grew most quickly 1965 and 1999 — a period, Pielke notes, when “nuclear power increas[ed] by a factor of 100 and hydropower by a factor of 6.”) Another way to look at the same phenomenon is to measure the “carbon-intensity” of the world’s energy sector — that is, how many tons of carbon dioxide are released into the atmosphere for each unit of energy that’s generated. This takes into account improvements in efficiency and the fact that natural gas is a cleaner fossil fuel than coal. Here, too, there’s been a real stagnation over the past few decades. Check out that gray line: This chart comes from a report this year by the International Energy Agency, which notes that since 1990, the carbon-intensity of the global economy has improved by a mere 1 percent — despite all the concern and all the conferences on climate change. If that trend continues, the IEA says, global carbon-dioxide emissions will keep rising sharply and climate models suggest the Earth could heat up by as much as 6°C (10.8°F) over the long term. That’s what the purple line represents. By the way, the World Bank isn’t sure that humanity will be able to adapt to even 4°C of warming. So 6°C isn’t exactly ideal. Now, alternatively, if the world wants to avoid that balmy fate and keep global warming below 2°C, then carbon intensity will have to improve dramatically — far more dramatically than we’ve seen over the last four decades. That’s what the blue line represents. Is the blue line actually possible? That’s the trillion-dollar question. The full IEA report, “Tracking Clean Energy Progress 2013“ (pdf) has a slew of ideas on how to clean up the world’s energy sector. For instance, global coal use would have to peak before 2020; power plants and factories would have to get a lot more efficient; things like nuclear power and renewables would have to expand at an even faster rate. For now, though, the world’s not on track.

#### Even if funding continues – lack of innovation kills the industry.

Stepp 5-14-2012 (Matthew, Senior Policy Analyst @ Information Technology and Innovation Foundation, http://energy.nationaljournal.com/2012/05/boom-and-bust-renewable-energy.php)

But even if much of this funding continues, the nascent clean tech industry is on a potential path of stagnation. In absence of long-term, significantly larger subsidies (which are politically unlikely), government support for clean energy R&D are central to developing and deploying competitive clean tech. In other words, clean tech growth nationwide (and globally) will be determined not by subsidies, but by innovation that can lead to technologies that are better and cheaper than fossil fuels. Yet, our policy choices often don’t reflect this reality. According to ITIF’s Energy Innovation Tracker, the U.S. is investing roughly $6 billion in clean energy R&D in FY2012 – on average a third what leading experts think the U.S. should be investing. In fact, the bulk of the federal government’s historic investment in clean energy – nearly three quarters of the $150 billion – is going to the deployment of existing technologies that are not cost-competitive with fossil fuel sources of energy. While these deployment incentives expand domestic supply chains and are spurring incremental innovations, the policies are acting like blunt force tools propping up lower-risk technologies while playing little role in incenting innovation and technologies to put clean energy on a path to subsidy independence. By not orienting the significant federal investment in clean tech towards spurring innovation while grossly underfunding R&D, the U.S. is failing to jump start and accelerate the clean tech innovations needed to create a robust, long-term sustainable industry. Even if the expiring tax incentives are extended as is, the long-term stagnation of the industry will still occur due to a lack of innovation. If we want a global clean tech revolution driven by the marketplace, we need to bring the equivalent of “Moore’s law” (the prediction that computing power would double every 24 months while costs would fall by half) to clean energy. Nothing less will work.

### Renewables Don’t Solve

#### Renewables not a standalone strategy – intermittency, efficiency is a prerequisite, grid alterations, electricity prices, and European examples aren’t in the context of the US grid.

Rosenthal 3-23 (Elisabeth, “Life After Oil and Gas”, NYTimes, http://www.nytimes.com/2013/03/24/sunday-review/life-after-oil-and-gas.html?pagewanted=all&\_r=0)

“There is plenty of room for wind and solar to grow and they are becoming more competitive, but these are still variable resources — the sun doesn’t always shine and the wind doesn’t always blow,” said Alex Klein, the research director of IHS Emerging Energy Research, a consulting firm on renewable energy. “An industrial economy needs a reliable power source, so we think fossil fuel will be an important foundation of our energy mix for the next few decades.” Fatih Birol, chief economist at the 28-nation International Energy Agency, which includes the United States, said that reducing fossil fuel use was crucial to curbing global temperature rise, but added that improving the energy efficiency of homes, vehicles and industry was an easier short-term strategy. He noted that the 19.5 million residents of New York State consume as much energy as the 800 million in sub-Saharan Africa (excluding South Africa) and that, even with President Obama’s automotive fuel standards, European vehicles were on average more than 30 percent more fuel efficient than American ones. He cautioned that a rapid expansion of renewable power would be complicated and costly. Using large amounts of renewable energy often requires modifying national power grids, and renewable energy is still generally more expensive than using fossil fuels. That is particularly true in the United States, where natural gas is plentiful and, therefore, a cheap way to generate electricity (while producing half the carbon dioxide emissions of other fossil fuels, like coal). Promoting wind and solar would mean higher electricity costs for consumers and industry. Indeed, many of the European countries that have led the way in adopting renewables had little fossil fuel of their own, so electricity costs were already high. Others had strong environmental movements that made it politically acceptable to endure higher prices in order to reduce emissions.

#### Renewables fail – intermittency, base-load generation, and storage capacity plus government red tape

Bach 2012 (Nate, J.D. from UCLA School of Law, “The Future of the United States Renewable Sector”, Energy Acuity, http://www.energyacuity.com/blog/bid/219632/The-Future-of-the-United-States-Renewable-Sector)

In any election year, energy use and production has and always will be an important topic of discussion. Governor Romney’s plan involves the intent to start widespread offshore oil drilling in the United States, as well as allowing the wind Production Tax Credit (PTC) to expire. This captures a large focus of Romney’s campaign: renewable energy, specifically wind power, is not an effective, viable, or affordable source of energy. In contrast, the Obama administration has said that it will maintain its steadfast commitment to the development of renewable energy sources such as wind, solar, and biofuels. This has drawn the ire of many people, both liberal and conservative, who feel that the costs for developing renewable energy, and the government subsidies provided to developers, are far too high. Romney’s plan also contends that there is uneven playing field for all forms of energy development, citing the tax credits and subsidies granted to renewable, as opposed to conventional energy, as a waste of tax payer money and time. However, while the current cost of installing these systems is high, there are many who attest that this is due to a plethora of policy limitations and setbacks that belabor the process of gaining permission to construct a solar array or wind farm. John Farrell of the Institute for Local Self-Reliance wrote an article comparing the costs and process of installing a 4kw solar array between the United States and Germany . This article shows that, while these costs are indeed high, we do have the power to lower them by creating a streamlined way for renewable projects to apply for and receive permitting. No matter your stance on the renewable sector, there can be no doubt that the development of these energy sources will be at the forefront of this upcoming election, and in some sense the fate of the industry relies heavily on the incumbent resuming his position come January. Many of the detractors of solar and wind power, no matter their political affiliations, focus their complaints on the fact that the production of renewable energy depends entirely on something we cannot control, whether it be the speed of the wind or the limited time the sun spends in our sky. If wind speeds are too high – or too low – the turbine will shut off and no energy will be produced. Turbines are also shut down when too much power is being generated by conventional fuel sources in order to prevent bottlenecking in the electricity grid. For solar power, these limitations are much simpler and obvious: no sun = no power. André Broessel, through the company Rawlemon, has invented a new solar production system, called β.torics, using a glass globe that hopes to address and quash these production problems in the solar field. The sun’s rays would by intensified by passing through the glass and onto a reader, much like a typical concentrated photovoltaic system. However, this device has one aspect that has the potential to change the photovoltaic generation industry forever: the device works at night by harvesting and concentrating the light from the moon in the exact same way it does for the sun. While this device provides an extraordinarily larger amount of energy than a traditional photovoltaic system, it is still subject to weather restrictions, specifically cloud cover or nights when a new moon is in the sky. Despite all of the hindrances, the greatest problem that the renewable sector faces is energy storage. It doesn’t matter how much energy can be produced if there is nowhere to store that energy until it is needed. For example, towards the end of May, Germany, the world leader in installed photovoltaics, set a world record with 22 gigawatt-hours of solar power fed into the grid at the peak of one 24 hour period . The data indicates that this surge in power production met the needs of about half of the country’s power demand for Saturday, May 26. This is a big feather in the cap for the supporters of solar energy, but although this worked in Germany, it does not mean it will work everywhere. The development and subsequent energy production of large scale utility projects in the U.S. are especially subject to grid limitations, adding fodder to renewable energy detractors. If a system designed to provide power to an entire community fails to do so due to grid or weather limitations, the money spent is therefore viewed by many as wasted or inappropriately allocated. However, as the systems or components themselves are being revamped or improved, so too are the storage systems. For example, a German company, Center for Solar Energy and Hydrogen Research Baden-Wȕrttemberg, has developed an innovative and effective way to store electricity generated from renewables. The technology involves converting water into methane gas by using the electricity produced and carbon dioxide and subsequently storing the gas in underground caverns. It stays there until there is a need for electricity that other sources can’t produce, channeling the gas to a firing plant, much in the same way that Landfill Gas is stored and used. While this does require a preexisting area for this gas to be allocated, it shows a clear dedication to not allow the advancement of the renewable energy industry to fall victim to technological limitations. So what do these developments mean for renewables in the United States? While both the β.torics system and the Power-to-Gas technologies are being developed in Europe, their extraordinary functionality is something the whole world should take note of. Certainly, these two devices alone would not be enough to spark a countrywide “green revolution,” especially given the almost inconceivable amount of red tape and policy limitations our government has in place that hinders the development of any renewable energy project. But what this provides is proof that the practical production and distribution of clean energy is possible. These developments will certainly pave the way for many other companies to develop new ways to store energy and new ways to effectively generate it. The industry is constantly growing and changing, and while the technologies may not be developed enough to make any big splashes come November, it is imperative to keep these discussions in mind when addressing the potential of renewable energy and what we, as a country, can do to establish a new road for the renewable sector to grow and provide clean and inexpensive energy to the entire population.

#### Renewables fail – base-load power generation

Forsberg 2011 (Charles Forsberg, executive director of the MIT Nuclear Fuel Cycle Study in the Department of Nuclear Science and Engineering at MIT and former Corporate Fellow at Oak Ridge National Laboratory, October 6, 2011, “What alternatives to nuclear energy?,” Bulletin of Atomic Scientists, http://www.thebulletin.org/web-edition/roundtables/nuclear-energy-different-other-energy-sources#rt8801)

For those opposed to nuclear energy, the belief is that there are alternative energy sources -- a faith in alternatives, ironically, as strong as some of the early advocates for nuclear power in the 1950s. But no such options exist in a world that will soon have 10 billion people (see Forsberg, "Mutually Assured Energy Independence"). That fundamental reality dictates the need for nuclear energy. Climate change, fossil fuels, and famine. We have fossil fuels; however, the burning of fossil fuels releases carbon dioxide into the atmosphere with the potential for large changes in (1) climate and (2) pH (acidity) of water and soil. Both threaten agricultural productivity, because the changing climate moves agriculture to less productive soils. A consistent climate is critical in the formation of fertile soils -- a several-thousand-year process. Climate change also may entail rebuilding much of man’s infrastructure, which is designed for specific climate and sea-level conditions. Betting on fossil fuels is a high-risk strategy for world agriculture and food supplies. While carbon dioxide sequestration will work in a few locations, it's unlikely to be a universal solution. Renewables: latitude counts. We live on a globe circling the sun that creates seasons. That reality means that renewable systems must address how to store energy on a daily, weekly, and seasonal basis. It also drives the design of future energy systems. At MIT, we examined electricity-storage requirements for California assuming three energy futures: (1) all electricity produced by nuclear reactors operating at constant output, (2) all electricity produced by wind assuming California wind conditions and the National Renewable Energy Laboratory (NREL) wind model, and (3) all electricity produced by solar using the NREL solar-trough model that includes limited energy storage. Table 1 shows the fraction of electricity that has to go into storage at times of excess electricity production to provide electricity when demand exceeds supply. The hourly storage requirements were determined by using the hourly demand curves for electricity and the hourly electricity outputs of solar or wind or nuclear in California. The weekly storage requirements assumed that smart grids, pumped storage, and other technologies could result in each week having a uniform electricity demand, but different weeks have different electricity demands. It is thus a measure of the seasonal storage requirements that needs to be identified, assuming different energy sources with seasonal storage requirements measured in 10s to 100s of gigawatts per year depending upon the electricity prod uction technology. Two-thirds of our electricity is base-load electricity; base-load nuclear energy has low electricity storage requirements. The storage requirements for solar and wind, however, are higher. In fact, the situation is even worse than indicated in Table 1, because the calculations assumed perfect storage systems. Real seasonal storage systems have just 50 percent efficiency but may ultimately increase to 70 percent. In other words, serious wind and solar energy initiatives require massive seasonal storage systems. There are seasonal energy storage technologies being developed, such as nuclear-geothermal gigawatts per year and hydrogen systems. In a nuclear-geothermal energy storage system at times of low electricity demand, nuclear energy is used to heat a 500-meter cube of rock a kilometer or more underground to create an artificial geothermal heat source for peak power production. However, there is no way to insulate rock a kilometer underground. The heat losses are only a few percent on a large system but prohibitive in smaller systems -- that is, it is a technology that only couples to large-scale nuclear energy. The potentially viable seasonal electricity storage technologies (including hydrogen) either couple to nuclear plants or involve synergistic combinations of nuclear and renewables -- but viable storage technologies do not couple efficiently to wind and solar. Renewable advocates point to Denmark and Germany -- countries whose wind systems depend upon Scandinavian hydro. However, there is not enough hydro worldwide to make a serious dent in the storage challenge. An all-renewables world will remain unaffordable -- even if the cost of renewables drop because of the larger challenge of energy storage to match production with demand. Conclusions. Our energy challenge requires nuclear and renewables -- technologies that are complementary in many applications. Energy is over 10 percent of the global GNP, so economics matters because mankind needs more than energy to prosper. The risks of nuclear energy are small compared with the alternatives of oil wars, climate change, or unaffordable energy.

#### Renewables fail – intermittency

Gue 2010 (Elliott H. Gue, energy markets analyst, October 11, 2010, “Nuclear Power: A Better Investment than Alternative Energy,” Investing Daily, http://www.investingdaily.com/13512/nuclear-power-a-better-investment-than-alternative-energy)

Renewable and alternative energies are the centerpiece of many governments’ energy policies. Germany has been a market leader in wind and solar. Generous feed-in tariffs effectively guarantee attractive returns for new alternative energy projects for 20 years. Despite relatively modest wind and solar resources, Germany is among the fastest-growing markets in the world for both technologies. Although alternative energies hold some longer-term promise, blind and seemingly unwavering confidence in these solutions near-term benefits is misplaced. By their very nature, wind and solar power are intermittent energy sources; when the wind isn’t blowing or the sun isn’t shining, natural gas-fired plants provide for much of the shadow capacity that keeps the electricity flowing. This pie graph breaks down Germany’s electricity mix from 1998 to 2008. As you can see, thermal sources–primarily gas and coal–have lost share in Germany’s electricity grid over the past decade, though they still accounts for more than half of the nation’s net power generation. Natural gas consumption is up roughly 8 percent over this period, but coal use has flattened or declined. Although Germany’s generous subsidies have increased its wind-power capacity significantly, this renewable energy accounts for just 6 percent of total generation. The country’s investments have produced a relatively small increase in electricity generated from wind power. Wishful thinking aside, current wind- and solar-power technologies don’t offer a real alternative to fossil fuels.

## Warming Debate

### Not Anthropogenic

#### No anthropogenic warming

– cloud feedbacks AND PDO proves\*\*\*

Spencer ‘10 – climatologist and a Principal Research Scientist for U. of Alabama [Roy W, Ph.D. in meteorology at the University of Wisconsin-Madison in 1981, former Senior Scientist for Climate Studies at NASA’s Marshall Space Flight Center, where he and Dr. John Christy received NASA’s Exceptional Scientific Achievement Medal for their global temperature monitoring work with satellites, “The Great Global Warming Blunder: How Mother Nature Fooled the World's Top Climate Scientists”, pg # below)

IN SCIENCE it only takes **only one finding** to overturn decades of mainstream belief. Scientific knowledge is **not a matter of consensus**, as if scientific truth were something to be voted on. It is either true or not true. I have described new and important scientific evidence-some published, some unpublished at this writing—that supports two major conclusions that could end up dismantling the theory of anthropogenic global warming. The first conclusion is that recent satellite measurements of the Earth reveal the climate system to be relatively insensitive to warming influences, such as humanity's greenhouse gas emissions. This insensitivity is the result of more clouds forming in response to warming, thereby reflecting more sunlight back to outer space and reducing that warming. This process, known as negative feedback, is analogous to opening your car window or putting a sun shade over the windshield as the sun begins to heat the car's interior. An insensitive climate system does not particularly care how much we drive suvs or how much coal we burn for electricity. This evidence directly contradicts the net positive feedback exhibited in the computerized climate models tracked by the IPCC. It is well known that positive feedback in these models is what causes them to produce so much warming in response to humanity's greenhouse gas emissions. Without the high climate sensitivity of the models, anthropogenic global warming becomes **little more than** a minor **academic curiosity**. 153 The strong negative feedback in the real climate system has not been noticed by previous researchers examining satellite data because- they have not been careful about inferring causation. As is the case in all realms of scientific research, making the measurements is much easier than figuring out what those measurements mean in terms of cause and effect. Climate researchers have neglected to account for clouds causing temperature change (forcing) when they tried to determine how temperature caused clouds to change (feedback). They mixed up cause and effect when analyzing year-to-year variability in clouds and temperature. You might say they were fooled by Mother Nature. Clouds causing temperature to change created the illusion of a sensitive climate system. In order to help you understand this problem, I have used the example that I was given when I asked the experts how they knew that feedbacks in the climate system were positive. It was explained to me that when there is an unusually warm year, researchers have found that there is typically less cloud cover. The researchers assumed that the warming caused the decrease in cloud cover. This would be positive feedback because fewer clouds would let in more sunlight and thereby amplify the warming. But I always wondered: How did they know that it was the warming causing fewer clouds, rather than fewer clouds causing the warming? As we have seen, **they didn’t** know. And when the larger, contaminating effect of clouds causing temperature change is taken into account, the true signal of negative feedback emerges from the data. I have demonstrated this with a simple climate model by showing that the two directions of causation-forcing and feedback (or cause and effect) have distinctly different signatures both in the satellite data and in a simple model of the climate system. These distinct signatures even show up in the climate models tracked by the IPCC. Probably as a result of the contusion between cause and effect, climate models have been built to be too sensitive, with clouds erroneously amplifying rather than reducing warming in response to increasing atmospheric carbon dioxide concen 154 trations. The models then predict **far too much warming** when the small warming influence of more man-made greenhouse gases is increased over lime in the models. This ultimately results in pre-dictions of serious lo catastrophic levels of warming for the future, which you then hear about through the news media. While different models predict various levels of warming, all of them exhibit positive feedbacks. The mix-up between cause and effect also explains why feedbacks previously diagnosed from satellite observations of the Earth by other researchers have been so variable. There have been differing levels of contamination of the feedback signal by forcing, depending on what year the satellites were observing the Earth The second major conclusion of this book is closely connected to the first. If the carbon dioxide we produce is not nearly enough to cause significant warming in a climate system dominated by negative feedback, then what caused the warming we have experienced over the last fifty years or more? New satellite measurements indicate that most of the global average temperature variability we have experienced in the last 100 years could have been caused by a natural fluctuation in cloud cover resulting from the Pacific: Decadal Oscillation (PDO). **Nine years of our best NASA satellite data,** combined with a simple climate model, reveal that the PDO causes cloud changes that might be sufficient to explain most of the major variations in global average temperature since 1900, including 75 percent of the warming trend. Those natural variations in clouds may be regarded as chaos in the climate system-direct evidence that the Earth is capable of causing its own climate change. Contrary to the claims of the IPCC, global warming or cooling does not require an external forcing mechanism such as more greenhouse gases, or a change in the sun, or a major volcanic eruption**. It is simply what the climate system does.** The climate system itself can cause its own climate change, supporting the widespread public opinion that global warming might simply be part of a **natural cycle**. I am not the first to suspect that the PDO might be causing climate change. I just look the issue beyond suspicion, with a quantitative 155 explanation based on both satellite observations and some analysis with a simple climate model. While some might claim that the timing of the PDO and associated changes in cloudiness in recent years is just a coincidence, I can make **the same claim for the** supposed **anthropogenic explanation** of global warming: Just because warming in the twentieth century happened during a period of increasing CO2 in the atmosphere **doesn't** necessarily **mean that the increasing CO2 caused the warming**. In fact, the PDO explanation for warming actually has a couple of advantages over the CO2 explanation. The first advantage is the fact that variations in cloud cover associated with the PDO actually "predict" the temperature changes that come later. It just so happens that the three PDO changes that occurred in the twentieth century were exactly what would be needed to explain most of the temperature changes that followed: warming until the 1940s, then slight cooling until the 1970s, and then resumed warming through the 1990s. This then answers a question I am sometimes asked: How do I know that the PDO-induced cloud changes caused the temperature changes, and not the other way around? It's because the temperature response comes after the forcing, not before. This PDO source of natural climate change can also explain 75 percent of the warming trend during the twentieth century. Addition of CO2 and other anthropogenic and natural forcings can explain the other 25 percent. This investigation took me only a few days with a desktop computer. In contrast, researchers have been tinkering for many years with various estimates of manmade aerosol (particulate) pollution in their attempts to explain why global warming stopped between 1940 and the late 1970s, even though this was a period of rapid increase in our greenhouse gas emissions. So, while the PDO explanation for temperature variations during the twentieth century fits like a hand in a glove, the IPPC’s explanation based on aerosol and greenhouse gas pollution had to be **wedged in with a crowbar.** Another advantage of the natural explanation for global 155 warming is that the mechanism-an energy imbalance of the Karth caused by natural cloud variations-was actually observed by satellite. In contrast, the cooling effects of aerosol pollution and the warming effects of greenhouse gas emissions have remained **too small to be measured**. They have to be calculated **theoretically** before being input into climate models. <153-156>

Reader note – PDO = Pacific Decadal Oscillation

### A2 Positive Feedbacks

#### No runaway warming

- even high co2 levels not catastrophic

- plant growth checks

- water vapor checks

- negative feedbacks => one degree warming

- their authors exaggerate

Meyer 12 (Warren, “Understanding the Global Warming Debate,” Forbes, 2/9/12, http://www.forbes.com/sites/warrenmeyer/2012/02/09/understanding-the-global-warming-debate/4/)

So what’s the problem? Why the debate? Isn’t this admission a “game over” for the skeptics? Actually, no. To understand this, let us do a bit of extrapolation. Current CO2 concentrations in the atmosphere today are around 390ppm, or about 0.039%. But even if we were to hit a relatively pessimistic level of 800ppm by the end of the century, this would, by the numbers above, imply a warming of about one degree. While potentially undesirable, a degree of warming is hardly catastrophic. The catastrophe comes from the second chained theory. The Positive Climate Feedback Theory As the Earth warms, we expect there to be changes that may further accelerate or decelerate the warming. These are called feedbacks. Take one example — as the Earth warms, there will likely be less snow and ice coverage of the Earth. Snow and ice tend to reflect heat back into space more than does bare land or water, so that this loss could add additional warming above and beyond the initial warming from CO2. On the opposite end of the scale, many plants grow faster with warmer air and more airborne CO2, and such growth could in turn reduce atmospheric carbon and slow expected warming. It turns out the critical feedback involves water vapor. While CO2 is indeed a greenhouse gas, it is a weak one when compared to water vapor. Rising temperatures may increase evaporation and therefore the amount of water vapor in the air, thus adding powerful greenhouse gasses to the atmosphere and accelerating warming. On the other hand, water evaporated by rising temperatures may form more clouds that shade the Earth and help to reduce temperatures. Whether future man-made global warming is catastrophic depends a lot on the balance of these effects. The IPCC assumed that strong positive feedbacks dominated, and thus arrived at numbers that implied that feedbacks added an additional 2-4 degrees to the 1 degree from CO2 directly. So in the IPCC numbers, at least two thirds of the future warming comes not from the basic greenhouse gas effect but a second independent theory that the Earth’s climate is dominated by strong positive feedbacks. Other more alarmist scientists have come up with feedback numbers even higher. When Al Gore says that we will see a tipping point where temperatures will run away, he is positing that feedbacks will be nearly infinite (a phenomenon we can hear with loud feedback screeches from a microphone). But the science of this positive climate feedback theory is far from settled. Just as skeptics are probably wrong to question the basic greenhouse gas effect of CO2, catastrophic global warming advocates are wrong to over-estimate our understanding of these feedbacks. Not only may the feedback number not be high, but it might be negative, as implied by some recent research, which would actually reduce the warming we would see from a doubling of CO2 to less than one degree Celsius. After all, most long-term stable natural systems (and that would certainly describe climate) are dominated by negative rather than positive feedbacks.Nice Theory, But What Do We Actually See Happening? At some point, theorizing becomes stale unless the theories are supported by observations. And the most important single observation relative to catastrophic man-made global warming theory is that the world has indeed warmed over the last century, by perhaps 0.7C, coincident with the period mankind has burned a lot of fossil fuels. Some skeptics have tried, relatively futilely I think, to deny that the world is warming at all. Certainly skeptics have a lot of evidence that this measured warming may be exaggerated — there are some serious flaws in our surface temperature measurement system today and almost certainly much worse flaws in the numbers from, say, 1900 to which we are comparing current readings. But radically new technologies, such as satellites, that are not susceptible to these same flaws and coverage gaps have still measured an upward drift in temperatures over the last 30 years.

#### Warming won’t cause extinction

– their impacts are alarmism, not supported by experts

Mauldin 6/4/12 – B.S. and M.S. in electrical engineering from Cal-Berkeley, registered professional engineer (Paul, “Global Warming Alarmism: At the Tipping Point of Credibility?”, <http://smartenergyportal.net/article/global-warming-alarmism-tipping-point-credibility>)

If we believe all we're told then there is no hope. Why change anything? But, to the frustration and anger of the alarmists, we don't believe all we're told about a global warming doomsday. There's a growing belief both in the lay and scientific communities that there's another side to the story. There's mounting evidence that the presuppositions about human-caused climate change are wrong or at the best, distorted. The earth is warming, yes (although that's not all that clear to some), but our planet has gone through warming/cooling cycles in the past. Yes, there is a correlation with CO2 concentrations, but it's not clear which came first, the warming or the change in CO2. And the CO2/temperature-rise pairing cycles have also occurred throughout the past. But isn't the global warming skeptic community pretty much a bunch of ignorant, untrained, flat-earther types? Not at all, according to the study reported in Nature. (see The polarizing impact of science literacy and numeracy on perceived climate change risks). It turns out that the more scientifically literate you are, the less concerned you are about climate change. Scientific literacy and training leads one to follow their own rationale rather than to follow the herd. "Seeming public apathy over climate change is often attributed to a deficit in comprehension. The public knows too little science, it is claimed, to understand the evidence or avoid being misled. Widespread limits on technical reasoning aggravate the problem by forcing citizens to use unreliable cognitive heuristics to assess risk. We conducted a study to test this account and found no support for it. Members of the public with the highest degrees of science literacy and technical reasoning capacity were not the most concerned about climate change. Rather, they were the ones among whom cultural polarization was greatest. This result suggests that public divisions over climate change stem not from the public’s incomprehension of science but from a distinctive conflict of interest: between the personal interest individuals have in forming beliefs in line with those held by others with whom they share close ties and the collective one they all share in making use of the best available science to promote common welfare." If something just doesn't smell right about the smug but dire predictions frantically pumped out by the media and platoons of alarmist bloggers, you're going to question it. Particularly if you have a fundamental understanding of science and experience with the vagaries of the science/politics/media triumvirate. In the long run, continued climate-change fear mongering, hyperbole and name calling will destroy what little public interest is left. We might even see a 'brown' rebound, and that would be tragic.

### Adaptation

#### Adaptation solves

Goklany ‘11 (Dr. Indur, independent scholar who has worked with federal and state governments, think tanks, and the private sector over 35 years, former representative to the IPCC, former Julian Simon Fellow at the Property and Environment Research Center, a visiting fellow the American Enterprise Institute, part of a chapter from “Climate Coup: Global Warmings Invasion of Our Government and Our Lives”, page # below)

It is often argued that unless greenhouse gases are reduced forth with, the resulting global warming could have severe, if not catastrophic, consequences for developing countries because they lack the economic and human resources to cope with warming's consequences. But this argument has two major problems. First, although developing countries' adaptive capacity is low today, it does not follow that their ability to cope will be low forever. In fact, under the IPCC's warmest scenario, which would increase globally averaged temperature by 4 degrees Celsius relative lo 1990, net GDP per capita in developing countries (after accounting for losses due to climate change per the Stem Revieio's exaggerated estimates) will be double the United States' 2006 level in 2100, and triple that in 2200. Thus, developing countries should be able to cope with climate change substantially better in the future than the United States can today. But these advances in adaptive capacity, which are virtually ignored by most assessments of the impacts and damages from global warming, are the inevitable consequence of the assumptions built into the IPCC's emission scenarios. Hence, the notion that developing countries will be unable to cope with global warming does not square with the basic assumptions that underpin the magnitude of emissions, global warming, and its projected impacts under the IPCC scenarios. Second, global warming would not create new problems; rather it would exacerbate some existing problems of poverty (e.g., hunger, malaria, extreme events), while relieving others (e.g., habitat loss and water shortages in some places). One approach to dealing with the consequences of global warming is to reduce greenhouse gas emissions. That action would, however, reduce all global warming impacts, whether they are good (e.g., net reduction in the global population at risk of water shortage or in the habitat used for cultivation) or bad (e.g., arguably increased levels of malaria or hunger). And even where global warming provides no benefits, reducing emissions would at best only reduce global warming's contribution to the problem, but not the whole problem, since non-warming factors are also contributors.'111 With respect to mortality from hunger, malaria, and extreme events, for example, global warming only contributes 13 percent of the problem in 2085 (which is beyond the foreseeable future). Another approach to reducing the global warming impacts would be to reduce the climate-sensitive problems of poverty through "focused adaptation."10\* Focused adaptation would allow society to capture the benefits of global warming while allowing it to reduce the totality of climate-sensitive problems that warming might worsen. For mortality from hunger, malaria, and extreme events, for instance, focused adaptation could through the foreseeable future address 100 percent of the problem, whereas emission reductions would at most deal with only 13 percent. [182-184]

### A2 Ag Impact

#### Warming won’t collapse agriculture or produce famine – four reasons

Lomborg ’11 [Bjørn Lomborg is the author of The Skeptical Environmentalist and Cool It, director of the Copenhagen Consensus Center, and adjunct professor at Copenhagen Business School, (retrieved 4/22/2011), http://www.nato.int/docu/review/2011/Climate-Action/Food\_Security\_Solutions/EN/index.htm]

Several large-scale surveys that have looked at the effect of climate change on agricultural production and the global food trade system have four crucial findings in common. First, they envision a large increase in agricultural output – more than a doubling of cereal production over the coming century**.** In the words of one modeling team: “Globally, land and crop resources, together with technological progress, appear to be sufficient to feed a world population of about 9 billion people in 2080.” The most pessimistic models, expecting the most pessimistic climate impacts, expect a total reduction of agricultural production of 1.4% compared to a scenario without any climate change Second, the impact of global warming on agricultural production will probably be negative, but in total very modest. The most pessimistic models, expecting the most pessimistic climate impacts, expect a total reduction of agricultural production of 1.4% compared to a scenario without any climate change. The most optimistic model forecasts a net increase in agricultural production from global warming of 1.7%. To put these numbers in perspective, the average growth rate for agriculture over the past 30 years was about 1.7. Third, while there will be little change globally, this is not true regionally. In general terms, global warming has a negative impact on developing nations’ agriculture but a positive impact on developed nations’ agriculture. This cruel reality is because temperature increases are helpful for farmers in high latitudes (bringing longer growth seasons, multiple crops, and higher yields) but mean lower productivity for those in tropical countries. [Lomborg\_cropfield\_2.jpg] In worst-case scenarios, this will mean a 7% decrease in yield in the developing world and a 3% increase in the developed world. This is an issue that we must address, but we should also note the bigger picture: total production even in the least developed countries is expected to rise by about 270%. Over the coming century, developing nations will inevitably become more dependent on food imports from developed countries. This is not primarily a global warming phenomenon: even without global warming, imports for least developed countries would double over the century because of demographics. Global warming causes the import increase to go from about 100% to %110-140%. We should keep in mind that developing country consumers in 2080 will be considerably better off than they are today. One modeling team points out that future developing nation consumers “are largely separated from agricultural production processes, dwelling in cities and earning incomes in the non-agricultural sectors. As in today’s developed countries, consumption levels depend largely on food prices and incomes rather than on changes in domestic agricultural production.” Fourth, overall, global warming will be responsible for up to 28 million more malnourished people in the most likely scenario. (Other scenarios show lower impacts, ranging down to global warming causing an overall reduction in the number of malnourished people by 28 million). The extent of hunger depends less on climate and more on economics It is important to put this into context. The world now has about 925 million malnourished. Over the coming century we will add at least 2-3 billion more people, yet it is likely that towards the end of the century, there will be ‘only’ about 108 million people starving.

### A2 Bio-D Impact

#### No biodiversity loss

Carter et al. 11—lead authors are Robert Carter, Ph.D., Adjunct Research Fellow at James Cook University – AND – Craig Idso, Ph.D., Chairman at the Center for the Study of Carbon Dioxide and Global Change – AND – Fred Singer, Ph.D., President of the Science and Environmental Policy Project; contributing authors are Susan Crockford, Joseph D’Aleo, Indur Goklany, Sherwood Idso, Madhav Khandekar, Anthony Lupo, Willie Soon, and Mitch Taylor (© 2011, Climate Change Reconsidered: 2011 Interim Report, The Heartland Institute, http://www.nipccreport.org/reports/2011/pdf/2011NIPCCinterimreport.pdf)

According to the Intergovernmental Panel on Climate Change (IPCC), ―new evidence suggests that climate-driven extinctions and range retractions are already widespread‖ and the ―projected impacts on biodiversity are significant and of key relevance, since global losses in biodiversity are irreversible (very high confidence)‖ (IPCC-II, 2007, p. 213). The IPCC claims that ―globally about 20% to 30% of species (global uncertainty range from 10% to 40%, but varying among regional biota from as low as 1% to as high as 80%) will be at increasingly high risk of extinction, possibly by 2100, as global mean temperatures exceed 2 to 3°C above pre-industrial levels‖ (ibid.). The Nongovernmental International Panel on Climate Change (NIPCC) disagreed. According to Idso and Singer (2009), ―These claims and predictions are not based on what is known about the phenomenon of extinction or on real-world data about how species have endured the warming of the twentieth century, which the IPCC claims was unprecedented in the past two millennia‖ (p. 579). The basis of the IPCC‘s forecasts is an assumption that the increase in temperature predicted to result from the ongoing rise in the atmosphere‘s CO2 concentration will be so fast and of such great magnitude that many animal species will not be able to migrate poleward in latitude or upward in elevation rapidly enough to avoid extinction. In this chapter we review new research that contradicts this assumption as well as extensive observational data that contradict the claim of impending species extinctions.

#### Alt causes outweigh

Goklany ‘7 – PhD, science and tech policy analyst for the US Dept of the Interior

Indur M, M.S. and Ph.D are from Michigan State University, “the improving state of the world”, page number below in [brackets]

Notably, the current consequences of anthropogenic climate change are dwarfed by numerous other environmental and public health problems facing humanity today. Even if one accepts the dubious estimates of present-day health consequences of climate change presented in the World Health Report 2002, that same report shows that climate change contributes less than 0.4 percent to the global burden of disease (see chapter 6). Climate change, in fact, ranks 15th or 16th in importance out of 19 global health risk factors related to food, nutrition, and environmental and occupational exposure, depending on whether the ranking is based on mortality or lost disability-adjusted life years (DALVs).8 Cumulatively, these 19 risk factors account for 54 percent of all mortality and 38 percent of lost DALYs globally. [page 290]

### A2 Oceans Impact

#### Ocean acidification thesis wrong – won’t cause extinction, C02 actually helps, and alt causes outweigh

Ridley ’12 – BA and PhD from Oxford (worked for the Economist for nine years as science editor, Washington correspondent and American editor, before becoming a self-employed writer and businessman, “Taking Fears of Acid Oceans With a Grain of Salt”, Jan 7, http://online.wsj.com/article/SB10001424052970203550304577138561444464028.html)

Coral reefs around the world are suffering badly from overfishing and various forms of pollution. Yet many experts argue that the greatest threat to them is the acidification of the oceans from the dissolving of man-made carbon dioxide emissions. The effect of acidification, according to J.E.N. Veron, an Australian coral scientist, will be "nothing less than catastrophic.... What were once thriving coral gardens that supported the greatest biodiversity of the marine realm will become red-black bacterial slime, and they will stay that way." This is a common view. The Natural Resources Defense Council has called ocean acidification "the scariest environmental problem you've never heard of." Sigourney Weaver, who narrated a film about the issue, said that "the scientists are freaked out." The head of the National Oceanic and Atmospheric Administration calls it global warming's "equally evil twin." But do the scientific data support such alarm? Last month scientists at San Diego's Scripps Institution of Oceanography and other authors published a study showing how much the pH level (measuring alkalinity versus acidity) varies naturally between parts of the ocean and at different times of the day, month and year. "On both a monthly and annual scale, even the most stable open ocean sites see pH changes many times larger than the annual rate of acidification," say the authors of the study, adding that because good instruments to measure ocean pH have only recently been deployed, "this variation has been under-appreciated." Over coral reefs, the pH decline between dusk and dawn is almost half as much as the decrease in average pH expected over the next 100 years. The noise is greater than the signal. Another recent study, by scientists from the U.K., Hawaii and Massachusetts, concluded that "marine and freshwater assemblages have always experienced variable pH conditions," and that "in many freshwater lakes, pH changes that are orders of magnitude greater than those projected for the 22nd-century oceans can occur over periods of hours." This adds to other hints that the ocean-acidification problem may have been exaggerated. For a start, the ocean is alkaline and in no danger of becoming acid (despite headlines like that from Reuters in 2009: "Climate Change Turning Seas Acid"). If the average pH of the ocean drops to 7.8 from 8.1 by 2100 as predicted, it will still be well above seven, the neutral point where alkalinity becomes acidity. The central concern is that lower pH will make it harder for corals, clams and other "calcifier" creatures to make calcium carbonate skeletons and shells. Yet this concern also may be overstated. Off Papua New Guinea and the Italian island of Ischia, where natural carbon-dioxide bubbles from volcanic vents make the sea less alkaline, and off the Yucatan, where underwater springs make seawater actually acidic, studies have shown that at least some kinds of calcifiers still thrive—at least as far down as pH 7.8. In a recent experiment in the Mediterranean, reported in Nature Climate Change, corals and mollusks were transplanted to lower pH sites, where they proved "able to calcify and grow at even faster than normal rates when exposed to the high [carbon-dioxide] levels projected for the next 300 years." In any case, freshwater mussels thrive in Scottish rivers, where the pH is as low as five. Laboratory experiments find that more marine creatures thrive than suffer when carbon dioxide lowers the pH level to 7.8. This is because the carbon dioxide dissolves mainly as bicarbonate, which many calcifiers use as raw material for carbonate. Human beings have indeed placed marine ecosystems under terrible pressure, but the chief culprits are overfishing and pollution. By comparison, a very slow reduction in the alkalinity of the oceans, well within the range of natural variation, is a modest threat, and it certainly does not merit apocalyptic headlines.

### A2 Disease Impact

#### Warming doesn’t increase disease deaths

Goklany ’11 [Dr. Indur, independent scholar who has worked with federal and state governments, think tanks, and the private sector over 35 years, former representative to the IPCC, former Julian Simon Fellow at the Property and Environment Research Center, a visiting fellow the American Enterprise Institute, part of a chapter from “Climate Coup: Global Warmings Invasion of Our Government and Our Lives”, page # below]

Disease Advocates of stringent greenhouse gas controls expect global warming to add to the global burdens of death and disease.1' However, average life expectancies around the world have increased from 31 years in 1900 to 47 years in the early 1950s and 69 years today.1" For developing countries, life expectancies increased from 25-30 years in 1900 to 41 years in the early 1950s and 69 years at present-'7 In fact, in virtually every country, "health-adjusted" life expectancies currently exceed unadjusted life expectancies from just a few decades ago.18 ("Health-adjusted" life expectancy is the life expectancy adjusted downward to partially discount the numbers of years of life that an average person would spend in a disabled or diseased condition.) In other words, people in developing countries are not only living longer, they are also healthier. Therefore, there has been less disease in the aggregate, humanity is much better able to cope with disease, or both. Disease is less of a problem today than it used to be. Despite the UN's extraordinary claims, the ranges of the most critical climate-sensitive infectious diseases have actually shrunk as the average surface temperature warmed. Consider malaria, which accounts for about 75 percent of the global burden of disease from vector-borne diseases.10 As indicated in Figure 6.3 (see color insert), the area in which malaria due to Plasmodium falciparum—the deadliest of the four protozoan parasites that cause malaria—is endemic, has been reduced substantially since 190O.3" Endemic/stable malaria is estimated to have covered 58 percent of the world's land surface around 1900 but only 30 percent by 2007. Today, P. falciparum malaria is restricted largely to developing countries in the tropics. Equally important, its prevalence has decreased within its currently reduced range, with endemicity falling by one or more classes in over two-thirds of the current range of stable transmission (Figure 6.3c). Gething and others note that of the 66 million knv of the Earth's surface thought to have sustained stable/endemic malaria in 1900,12%, 18% and 57% had exhibited proportional decreases in the reproductive number of up to one, between one and two, and greater than two orders of magnitude, respectively; 11% had shown no evidence of change; and 2% had shown evidence of an increase in the reproductive number by 2007.-'' Figure 6.3, however, does not show the rebound in malaria in many developing areas that occurred in the 1980s and 1990s caused by a combination of poor policies (e.g., cessation of indoor spraying of DDT in many countries), development of resistance to drugs and insecticides, and a deterioration of public health infrastructure in many African countries coincident with a period during which their economies deteriorated and AIDS was ascendant-12 Since then, however, matters have, for the most part, been turned around. The Living Proof Project reports that not only are malaria cases declining but the disease is killing fewer people. For example, between 2001 and 2006, deaths from malaria declined by 45 percent in Rwanda, 50 percent in Cambodia, 76 percent in the Philippines, 80 percent in Eritrea and Zanzibar, and 90 percent in S.lo Tome and Principe.23 [172-4]

### Impact Calc – Yes War

#### Great-power nuclear war’s possible

**Wittner 11** Lawrence Wittner is **Prof**essor of History emeritus **at SUNY**/Albany "Is a Nuclear War With China Possible?" 11/30/2011 www.huffingtonpost.com/lawrence-wittner/nuclear-war-china\_b\_1116556.html

While nuclear weapons exist, there **remains a danger** that **they will be used**. After all, for centuries national conflicts have led to wars, with nations employing **their deadliest weapons**. The current deterioration of U.S. relations with China might end up providing us with yet another example of this phenomenon. The gathering tension between the United States and China is clear enough. Disturbed by China’s growing economic and military strength, the U.S. government recently challenged China’s claims in the South China Sea, increased the U.S. military presence in Australia, and deepened U.S. military ties with other nations in the Pacific region. According to Secretary of State Hillary Clinton, the United States was “asserting our own position as a Pacific power.” But need this lead to nuclear war? Not necessarily. And yet, there are signs that it could. After all, both the United States and China possess large numbers of nuclear weapons. The U.S. government threatened to attack China with nuclear weapons during the Korean War and, later, during the conflict over the future of China’s offshore islands, Quemoy and Matsu. In the midst of the latter confrontation, President Dwight Eisenhower declared publicly, and chillingly, that U.S. nuclear weapons would “be used just exactly as you would use a bullet or anything else.” Of course, China didn’t have nuclear weapons then. Now that it does, perhaps the behavior of national leaders will be more temperate. But the loose nuclear threats of U.S. and Soviet government officials during the Cold War, when both nations had vast nuclear arsenals, should convince us that, even as the military ante is raised, nuclear saber-rattling persists. Some pundits argue that nuclear weapons prevent wars between nuclear-armed nations; and, admittedly, there haven’t been very many—at least not yet. But the Kargil War of 1999, between nuclear-armed India and nuclear-armed Pakistan, should convince us that such wars **can occur**. Indeed, in that case, the conflict **almost slipped into a nuclear war.** Pakistan’s foreign secretary threatened that, if the war escalated, his country felt free to use “any weapon” in its arsenal. During the conflict, Pakistan did move nuclear weapons toward its border, while India, it is claimed, readied its own nuclear missiles for an attack on Pakistan. At the least, though, don’t nuclear weapons deter a nuclear attack? Do they? Obviously, NATO leaders didn’t feel deterred, for, throughout the Cold War, NATO’s strategy was to respond to a Soviet conventional military attack on Western Europe by launching a Western nuclear attack on the nuclear-armed Soviet Union. Furthermore, if U.S. government officials really believed that nuclear deterrence worked, they would not have resorted to championing “Star Wars” and its modern variant, national missile defense. Why are these vastly expensive—and probably unworkable—military defense systems needed if other nuclear powers are deterred from attacking by U.S. nuclear might? Of course, the bottom line for those Americans convinced that nuclear weapons safeguard them from a Chinese nuclear attack might be that the U.S. nuclear arsenal is far greater than its Chinese counterpart. Today, it is estimated that the U.S. government possesses over five thousand nuclear warheads, while the Chinese government has a total inventory of roughly three hundred. Moreover, only about forty of these Chinese nuclear weapons can reach the United States. Surely the United States would “win” any nuclear war with China. But what would that “victory” entail? A nuclear attack by China would immediately slaughter at least 10 million Americans in a great storm of blast and fire, while leaving many more dying horribly of sickness and radiation poisoning. The Chinese death toll in a nuclear war would be far higher. Both nations would be reduced to smoldering, radioactive wastelands. Also, radioactive debris sent aloft by the nuclear explosions would blot out the sun and bring on a “nuclear winter” around the globe—destroying agriculture, creating worldwide famine, and generating chaos and destruction.

#### Nuclear war is possible and likely – causes extinction and turns the case

Morgan 9—Hankuk University of Foreign Studies, Yongin Campus (Dennis Ray, 10 July 2009, “World on fire: two scenarios of the destruction of human civilization and possible extinction of the human race,” *Science Direct*)

Russell and Einstein warned of bombs that are thousands of times more powerful than those of Hiroshima or Nagasaki, bombs that would send ‘‘radio-active particles into the upper air’’ and then return to the Earth in the form of a ‘‘deadly dust or rain’’ that would infect the human race thousands of times greater than those ‘‘Japanese fishermen and their catch of fish,’’ to quite **possibly ‘‘put an end to the human race**.’’ They feared that ‘‘if many H-bombs are used there will be universal death, sudden only for a minority, but for the majority a slow torture of disease and disintegration.’’ [7]. Years later, in 1982, at the height of the Cold War, Jonathon Schell, in a very stark and horrific portrait, depicted sweeping, bleak global scenarios of total nuclear destruction. Schell’s work, The Fate of the Earth [8] represents one of the gravest warnings to humankind ever given. The possibility of complete annihilation of humankind is not out of the question as long as these death bombs exist as symbols of national power. As Schell relates, the power of destruction is now not just thousands of times as that of Hiroshima and Nagasaki; now it stands at more than one and a half million times as powerful, **more than fifty times enough to wipe out all of human civilization and much of the rest of life along with it** [8]. In Crucial Questions about the Future, Allen Tough cites that Schell’s monumental work, which ‘‘eradicated the ignorance and denial in many of us,’’ was confirmed by ‘‘subsequent scientific work on nuclear winter and other possible effects: humans really could be completely devastated. Our human species really could become extinct.’’ [9]. Tough estimated the chance of human self-destruction due to nuclear war as one in ten. He comments that few daredevils or high rollers would take such a risk with so much at stake, and yet ‘‘human civilization is remarkably casual about its high risk of dying out completely if it continues on its present path for another 40 years’’ [9]. What a precarious foundation of power the world rests upon. The basis of much of the military power in the developed world is nuclear. It is the reigning symbol of global power, the basis, – albeit, unspoken or else barely whispered – by which powerful countries subtly assert aggressive intentions and ambitions for hegemony, though masked by ‘‘diplomacy’’ and ‘‘negotiations,’’ and yet this basis is not as stable as most believe it to be. In a remarkable website on nuclear war, Carol Moore asks the question ‘‘Is Nuclear War Inevitable??’’ [10].4 In Section 1, Moore points out what most terrorists obviously already know about the nuclear tensions between powerful countries. No doubt, they’ve figured out that the best way to escalate these tensions into nuclear war is to set off a nuclear exchange. As Moore points out, all that militant terrorists would have to do is get their hands on one small nuclear bomb and explode it on either Moscow or Israel. Because of the Russian ‘‘dead hand’’ system, ‘‘where regional nuclear commanders would be given full powers should Moscow be destroyed,’’ it is likely that any attack would be blamed on the United States’’ [10]. Israeli leaders and Zionist supporters have, likewise, stated for years that if Israel were to suffer a nuclear attack, whether from terrorists or a nation state, it would retaliate with the suicidal ‘‘Samson option’’ against all major Muslim cities in the Middle East. Furthermore, the Israeli Samson option would also include attacks on Russia and even ‘‘anti-Semitic’’ European cities [10]. In that case, of course, Russia would retaliate, and the U.S. would then retaliate against Russia. China would probably be involved as well, as thousands, if not tens of thousands, of nuclear warheads, many of them much more powerful than those used at Hiroshima and Nagasaki, would rain upon most of the major cities in the Northern Hemisphere. Afterwards, for years to come, massive radioactive clouds would drift throughout the Earth in the nuclear fallout, bringing death or else radiation disease that would be genetically transmitted to future generations in a nuclear winter that could last as long as a 100 years, **taking a savage toll upon the environment and fragile ecosphere as well**. And what many people fail to realize is what a precarious, hair-trigger basis the nuclear web rests on. Any accident, mistaken communication, false signal or ‘‘lone wolf’ act of sabotage or treason could, in a matter of a few minutes, unleash the use of nuclear weapons, and once a weapon is used, then the likelihood of a rapid escalation of nuclear attacks is quite high while the likelihood of a limited nuclear war is actually less probable since each country would act under the ‘‘use them or lose them’’ strategy and psychology; restraint by one power would be interpreted as a weakness by the other, which could be exploited as a window of opportunity to ‘‘win’’ the war. In otherwords, once Pandora’s Box is opened, it will spread quickly, as it will be the signal for permission for anyone to use them. Moore compares swift nuclear escalation to a room full of people embarrassed to cough. Once one does, however, ‘‘everyone else feels free to do so. The bottom line is that as long as large nation states use internal and external war to keep their disparate factions glued together and to satisfy elites’ needs for power and plunder, these nations will attempt to obtain, keep, and inevitably use nuclear weapons. And as long as large nations oppress groups who seek self-determination, some of those groups will look for any means to fight their oppressors’’ [10]. In other words, as long as war and aggression are backed up by the implicit threat of nuclear arms, it is only a matter of time before the escalation of violent conflict leads to the actual use of nuclear weapons, and once even just one is used, it is very likely that many, if not all, will be used, leading to horrific scenarios of global death and the destruction of much of human civilization while condemning a mutant human remnant, if there is such a remnant, to a life of unimaginable misery and suffering in a nuclear winter. In ‘‘Scenarios,’’ Moore summarizes the various ways a nuclear war could begin: Such a war could start through a reaction to terrorist attacks, or through the need to protect against overwhelming military opposition, or through the use of small battle field tactical nuclear weapons meant to destroy hardened targets. It might quickly move on to the use of strategic nuclear weapons delivered by short-range or inter-continental missiles or long-range bombers. These could deliver high altitude bursts whose electromagnetic pulse knocks out electrical circuits for hundreds of square miles. Or they could deliver nuclear bombs to destroy nuclear and/or nonnuclear military facilities, nuclear power plants, important industrial sites and cities. Or it could skip all those steps and start through the accidental or reckless use of strategic weapons. [10] She then goes on to describe six scenarios for catastrophic nuclear exchanges between various nations. Each scenario incorporates color-coded sections that illustrate four interrelated factors that will determine how a nuclear war will begin, proceed and escalate. These factors are labeled as accidental, aggressive, pre-emptive, and retaliatory. As for the accidental factor of nuclear war, both the U.S. and Russia have ‘‘launch on warning’’ systems that send off rockets before confirmation that a nuclear attack is underway; thus, especially during a time of tensions, a massive nuclear war could take place within only 30 min after a warning—even if the warning is false. This scenario has almost happened on several occasions in the past. It was only because of individual human judgments, which disbelieved the false warnings, that nuclear war did not happen, but if the human judgment had indeed interpreted the warnings according to protocol, an all-out nuclear war would surely have taken place. Besides the accidental factor, another factor that could incite nuclear war is that of aggression. When nuclear powers are involved in wars of aggression, the nuclear option is always available. Especially when a nuclear power explicitly states that ‘‘all options are on the table,’’ concern about the nuclear option is well founded. Thus, Moore defines the aggressive factor as when ‘‘one or more nations decide to use weapons against a nuclear or non-nuclear nation in order to promote an economic, political or military goal, as part of an ongoing war or as a first strike nuclear attack. (The state, of course, may claim it is a preemptive, retaliatory or even accidental attack.)’’ [10].5 Especially in light of the recent U.S. attack on Iraq (ideologically based on Bush’s preventative war doctrine), the ‘‘pre-emptive’’ factor in instigating a nuclear war should be taken seriously. It is when one or more nations believe, whether correctly or incorrectly, or claims to believe ‘‘that another nuclear nation is about to use nuclear weapons against its nuclear, military, industrial or civilian targets and preemptively attacks that nation.’’ [10].6 Similarly, ‘‘brinkmanship’’ could play a role in nuclear war escalation as well. We can see how this brinkmanship scenario is currently underway in U.S. plans to build a missile defense shield in Poland, all set against the background of a militarist, expansionist Bush Administration that prosecuted a war of aggression against the sovereign country of Iraq and currently seems poised to do the same against Iran. As the U.S. proceeds with its plans to employ the missile defense shield in Poland, the Russians feel threatened and are now proceeding with countermeasures ‘‘to ensure its territory integrity and security are maintained.’’ [11]. Finally, the ‘‘retaliatory’’ factor in nuclear war scenarios is when nations respond to the use of weapons of mass destruction (whether nuclear, chemical or biological) by attacking with nuclear weapons. Then, once again, when the evil genie is let loose from the bottle, counter retaliatory strikes lead to escalation by the parties involved, as well as other concerned parties. All of these interrelated factors are woven into the storyline of Moore’s six scenarios that depict how a nuclear war might start and escalate. The ‘‘bottom line assumption’’ is that any nuclear exchange will (under a ‘‘use it or lose it’’ mentality) result in a series of escalations among immediate parties and their allies that will spiral out of control ‘‘until most of the planet’s 20,000 odd nuclear weapons are exhausted.’’ [10].7 Thus does Moore dismiss the limited exchange assumption, which does not take into account that ‘‘whatever can go wrong will go wrong’’ and especially the ‘‘use them or lose them’’ underlying psychology or strategy. There is simply no way to demonstrate that limited strikes will stay limited. Under such unprecedented circumstances, the unpredictable element of human nature would certainly determine the extent of the global nuclear holocaust, and when we consider the predominate fear that underlies the psychology of the nuclear game of death, perhaps that element of human nature is not so unpredictable after all; fear will insure that an all-out nuclear war would prevail rather than limited strikes.

### Impact Calc – Nuke War = Extinction

#### Nuclear war causes extinction—most qualified evidence

Robock ’11 (Alan, Department of Environmental Sciences, Rutgers University, “Nuclear winter is a real and present danger”, May 18, <http://www.nature.com/nature/journal/v473/n7347/full/473275a.html>)

In the 1980s, discussion and debate about the possibility of a 'nuclear winter' helped to end the arms race between the United States and the Soviet Union. As former Soviet president Mikhail Gorbachev said in an interview in 2000: “Models made by Russian and American scientists showed that a nuclear war would result in a nuclear winter that would be **extremely destructive to all life on Earth**; the knowledge of that was a great stimulus to us, to people of honour and morality, to act.” As a result, the number of nuclear weapons in the world started to fall, from a peak of about 70,000 in the 1980s to a total of about 22,000 today. In another five years that number could go as low as 5,000, thanks to the New Strategic Arms Reduction Treaty (New START) between the United States and Russia, signed on 8 April 2010. Yet the environmental threat of nuclear war **has not gone away**. The world faces the prospect of a smaller, **but still catastrophic**, nuclear conflict. There are now nine nuclear-weapons states. Use of **a fraction** of the global nuclear arsenal by anyone, from the superpowers to India versus Pakistan, still presents the largest potential environmental danger to the planet by humans. That threat is being ignored. One reason for this denial is that the prospect of a nuclear war is so horrific on so many levels that most people simply look away. Two further reasons are myths that persist among the general public: that the nuclear winter theory has been disproved, and that nuclear winter is no longer a threat. **These myths need to be debunked**. The term 'nuclear winter', coined by Carl Sagan and his colleagues in a 1983 paper1 in Science, describes the dramatic effects on the climate caused by smoke from fires ignited by nuclear attacks on cities and industrial areas. In the 1980s my colleagues and I calculated, using the best climate models available at the time, that if one-third of the existing arsenal was used, there would be so much smoke that surface temperatures would plummet below freezing around the world for months, **killing virtually all plants** and producing **worldwide famine.** More people could die in China from starvation than in the nations actively bombing each other. As many countries around the world realized that a superpower nuclear war would be a disaster for them, they pressured the superpowers to end their arms race. Sagan did a good job of summarizing the policy impacts2 in 1984: although weapons were continuing to be built, it would be suicide to use them. The idea of climatic catastrophe was fought against by those who wanted to keep the nuclear-weapon industry alive, or who supported the growth of nuclear arsenals politically3. Scientifically, there was no real debate about the concept, only about the details. In 1986, atmospheric researchers Starley Thompson and Stephen Schneider wrote a piece in Foreign Affairs appraising the theory4 and highlighting what they saw as the patchiness of the effect. They coined the term 'nuclear autumn', noting that it wouldn't be 'winter' everywhere in the aftermath of a nuclear attack. They didn't mean for people to think that it would be all raking leaves and football games, but many members of the public, and some pro-nuclear advocates, preferred to take it that way. The fight over the details of the modelling caused a rift between Sagan and Schneider that never healed. When I bring up the topic of nuclear winter, people invariably tell me that they think the theory has been disproved. But **research continues to support the original concept**. By 2007, models had began to approximate a realistic atmosphere up to 80 kilometres above Earth's surface, including the stratosphere and mesosphere. This enabled me, and my coauthors, to calculate for the first time that smoke particles would be heated by the Sun and lifted into the upper stratosphere, where they would stay for many years5, 6. So the cooling would last for much longer than we originally thought. Dark days Many of those who do accept the nuclear-winter concept think that the scenario applies only to a mass conflict, on a scale no longer conceivable in the modern world. This is also false. A 'small' nuclear war between India and Pakistan, with each using 50 Hiroshima-size bombs (far less than 1% of the current arsenal), if dropped on megacity targets in each country would produce climate change unprecedented in recorded human history5. Five million tonnes of black carbon smoke would be emitted into the upper troposphere from the burning cities, and then be lofted into the stratosphere by the heat of the Sun. Temperatures would be lower than during the 'Little Ice Age' (1400–1850), during which famine killed millions. For several years, growing seasons would be shortened by weeks in the mid-latitudes (see 'A decade of cooling). Brian Toon at the University of Colorado in Boulder, Richard Turco at the University of California, Los Angeles, Georgiy Stenchikov at Rutgers University in New Brunswick, New Jersey, and I, all of whom were **pioneers in nuclear-winter research** in the 1980s, have tried, along with our students, to publicize our results. We have published refereed journal articles, popular pieces in Physics Today and Scientific American, a policy forum in Science, and now this article. But Foreign Affairs and Foreign Policy, perhaps the two most prominent foreign-policy magazines in English, **would not even review articles we submitted**. We have had no luck getting attention from the US government. Toon and I visited the US Congress and gave briefings to congressional staff on the subject two years ago, but nothing happened as a result. The US President's science adviser John Holdren has not responded to our requests — in 2009 and more recently — for consideration of new scientific results in US nuclear policy.

#### **Even a limited nuclear war would end life on Earth.**

Hellman, ‘8 [Martin, Professor, Stanford University, “Defusing the Nuclear Threat: A primer” Spring, 2008, http://www.nuclearrisk.org/1why\_now.php]

There are two primary failure modes of deterrence: a partial one that results in either a nuclear terrorist incident or a limited nuclear war, and a complete failure that results in full-scale nuclear war. Even a small partial failure would be horrific: A 10-kiloton bomb [less than one-tenth the power of many of today's warheads] detonated at Grand Central Station on a typical work day would likely kill some half a million people, and inflict over a trillion dollars in direct economic damage. America and its way of life would be changed forever. [Bunn 2003, pages viii-ix] A complete failure of deterrence is almost beyond imagination and conjures up mythic analogies. In a 1961 speech to a Joint Session of the Philippine Congress, General Douglas MacArthur, stated, "Global war has become a Frankenstein to destroy both sides. … If you lose, you are annihilated. If you win, you stand only to lose. No longer does it possess even the chance of the winner of a duel. It contains now only the germs of double suicide." In 1986, former Secretary of Defense Robert McNamara expressed a similar view: "If deterrence fails and conflict develops, the present U.S. and NATO strategy carries with it a high risk that Western civilization will be destroyed” [McNamara 1986, page 6]. In January 2007, George Shultz, William Perry, Henry Kissinger and Sam Nunn echoed those concerns when they quoted President Reagan’s belief that nuclear weapons were "totally irrational, totally inhumane, good for nothing but killing, possibly destructive of life on earth and civilization." [Shultz 2007] DoD and related studies, while couched in less emotional terms, still convey the horrendous toll that a full-scale nuclear war would exact: "The resulting deaths would be far beyond any precedent. Executive branch calculations show a range of U.S. deaths from 35 to 77 percent (i.e., from 79 million to 160 million dead) … a change in targeting could kill somewhere between 20 million and 30 million additional people on each side ... These calculations reflect only deaths during the first 30 days. Additional millions would be injured, and many would eventually die from lack of adequate medical care … millions of people might starve or freeze during the following winter, but it is not possible to estimate how many. … further millions … might eventually die of latent radiation effects." [OTA 1979, page 8] The same 1979 OTA report also noted the possibility of serious ecological damage [OTA 1979, page 9], a concern that assumed a new potentiality when the "TTAPS Report" [TTAPS 1983] noted that the ash and dust from so many nearly simultaneous nuclear explosions and their resultant firestorms might usher in a "nuclear winter" that could erase homo sapiens from the face of the earth, much as many scientists now believe the dinosaurs were wiped out by an "impact winter" caused by ash and dust from an asteroid impacting the Earth 65 million years ago. The TTAPS report produced a heated debate, and there is still no scientific consensus on whether a nuclear winter would follow a full-scale nuclear war. Recent work [Robock 2007, Toon 2007] suggests that even a limited nuclear exchange, or one between newer nuclear weapons states, such as India and Pakistan, could have devastating long-lasting climatic consequences due to the large volumes of smoke that would be generated by fires in modern megacities. In a full-scale nuclear war civilization would almost surely be destroyed, and there a reasonable possibility that no human beings would survive.